RAILROAD GAZETTE

FRIDAY, DECEMBER 21, 1877.

Griffith & Patterson's Continuous Draw Bar.

The ordinary draw-bars used on passenger and freight cars are attached to the ends of the body frames, so that in drawing the trains all the strains of tension must be transmitted by the frames, and in buffing the same frames must resist the strains of compression. It is a well-known fact that any material or structure which is subjected alternately to strains of compression and those of tension will be destroyed much sooner than if it must resist strains of one kind only. The object of the invention illustrated by the engravings is to provide a continuous iron bar or rod which shall extend the whole length of the car body, and which shall transmit all the strains required to draw the trains so that the car body frame itself shall resist strains of compression only.

Fig. 1 is an inverted plan of the floor framing of a car, and fig. 2 a side view showing a section of the draw-head at *A*. *B C D* is a wrought-iron rod which extends from one draw-head, *E*, to the other, *F*. The rod or bar has no positive or rigid connection with the car frame. At each end the former is fitted with sockets in the draw-heads, and is secured to the latter by keys, *B* and *D*, which can move lengthwise in slots (shown on the left at *a*) in the draw-heads. Behind or inside of each of the draw-heads buffer springs, *S, S'*, are placed. These springs bear against wooden blocking or timbers closed between them and the cross-timbers or body bolsters, *G G* and *G' G'*. When the strain on the draw-head *F*, is in the direction of the arrow *c* it is transmitted by the draw-bar *B C D* to the rear of the draw-head, *E*, which compresses the spring *S*, and the car is thus, as it were, *pushed* forward instead of being drawn by its own frame. If there are any cars coupled to the draw-head *E*, the strain of drawing them is transmitted by the draw-bar and not by the car-body frame, so that in drawing the train the only strain which each body must resist is that of being itself drawn or rather *pushed* ahead. If the drawhead *E* is subjected to a buffing strain, it compresses the spring *S*, while the key *B* slides in the slot *a*.

The draw-bar or rod is reduced in section between the shoulders *f f* in order to diminish its weight. Keys, one of which is shown at *e*, are inserted between the bolsters, so that in case the bar should break the body would be drawn by these keys.

Any form of draw-head can be used with this bar, and in case of breakage of one of them it can be replaced by a new one in a few minutes. The first cost of this arrangement is less than that of many of those now in use. It has now been applied to over 2,000 cars.

Mr. J. S. Patterson, Master Mechanic of the Indianapolis, Cincinnati & Lafayette Railroad, whose address is Cincinnati, Ohio, will give parties interested further information about this arrangement.

Fig. 1.

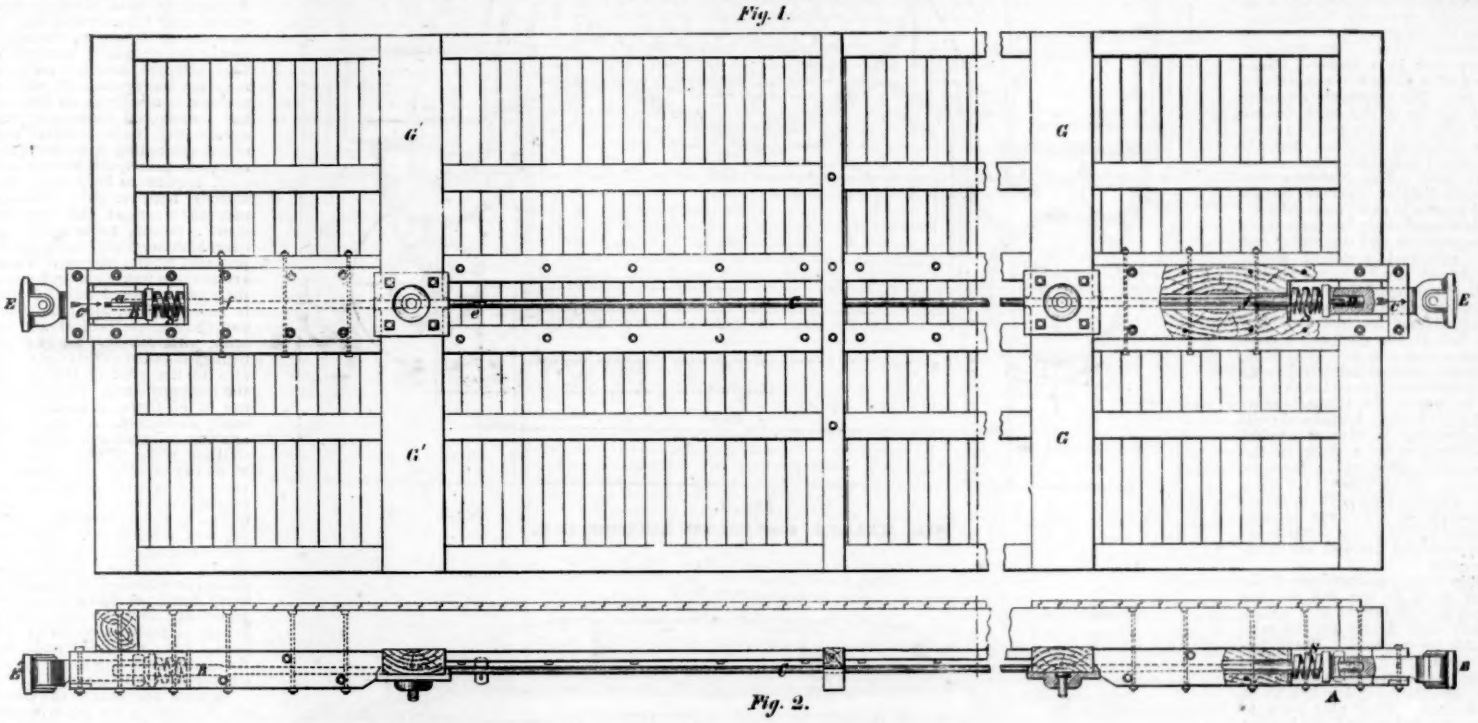

Fig. 2.

GRIFFITH & PATTERSON'S CONTINUOUS DRAW BAR.

The English General Manager.

The General Manager is the company's chief administrator. Equally with the Secretary, he sits at all board meetings to advise. His opinions are always needful to the direction in matters affecting the policy of the company, in its relations with its competitors, and in the development of its resources. To be successful he must be a man of vigorous intellect and of active habits, and should combine firmness of purpose with the grace of a conciliatory spirit. In his administrative capacity these invaluable qualities are inestimable. The officers and servants under his command, with various capacities and endowments, and with infinite shades of disposition, must ever, even in the most exceptional circumstances, be a source of worry to the manager; but that difficulty may be greatly mitigated if the office is held by a man who has the gift of *persuasion*. Autocratic rule is neither pleasant nor profitable; and it surely tends to degenerate the staff. If officers or servants feel that the will which governs them is unsympathizing, unflinching, quick to punish, and slow to commend, a doubtful and half-hearted obedience is the result; and resignation in disgust is the frequent corollary. In the army and navy, where implicit, unquestioning obedience is necessary to discipline, and where the nature and conditions of the service render breach of discipline a punishable offense, the superior officer who wields his authority with humanity and kindness compels a superior order of obedience to his will, and commands respect instead of fear. If, then, it has been ascertained and established in such autocratic services as those of the army and navy that *popular* rule, with needful firmness, is the best, how much more necessary is it in a voluntary service like the railway service that the management should be entrusted to those who have the power to *attract* as well as command. It requires little demonstration to prove that a constantly changing staff cannot be an *efficient* one; and that harshness and implacability are almost certain to produce dissatisfaction and desertion.

The office of General Manager, to be efficiently discharged, requires certain attainments and certain gifts in the incumbent. The gifts are, this power to administer without severity to which we have alluded; a genial address—the outcome of a pleasant disposition; a clear brain—apt to perceive and to generalize from complicated details; and ready and persuasive speech. The quality of good address is needful in the numerous negotiations in which a manager is certain to be engaged with traders, public corporations, etc., where "a soft answer turneth away wrath," and a conciliatory spirit conquers opposition and secures easy terms. Unclouded brains command respect everywhere; but nowhere more certainly than in positions of power and responsibility such as that of a ruling spirit of a great railway company. "Time is money" to the trading classes, and to the hard-wrought railway officer; and the man who is quick to apprehend all the intricacies of every project which is submitted for his consideration, is a most valuable, or rather invaluable acquisition to a company with much important work to do. Persuasive speech works wonders in the board-room, and in more private, but not less important, consultation with the departmental heads, with deputations of the traveling public with grievances to redress, or with the thousand-and-one outsiders who want things their own way, and mean to have them. In such cases, the power to say "No," and yet send his "deputations" and other troublesome and time-killing visitors away as well pleased as if he said "Yes," is a gift of the highest order in a General Manager. Such a man can make his demands upon a cheese-paring or short-sighted directorate with an almost certainty of having his own way, and may thus be at once a powerful advocate for his staff and the truest friend of his company. The attainment which should distinguish such an officer are those which he has acquired while graduating in more humble office. Having an efficient body-guard of officers in charge of the departments, each fitly furnished in his own sphere, it is not required that he should have exact knowledge of the working out of detail in each. He will generally be found to know enough of all, however, to be able to sympathize with the difficulties of each, and to be consulted with intelligence in emergency; and he will, moreover, while taking an independent view of each case which is submitted for judgment, be ready to set a proper value upon the opinions and advice of the officer consulting him. The responsibility of his office—he being, with the Secretary and Solicitor, a custodian of the company's unpublished policy—makes him reticent and cautious, and he finds it prudent, on occasion, to practice the virtue, the *golden* virtue, of *silence*. To a man who must necessarily mix much with public men, and is thus liable to insidious and specious flank movements to reach the whole truth of his company's intentions, this must be a trying ordeal, and he who has acquired the art of so answering such attacks as to cover his own retreat without giving anything up, has graduated in a good school. We can remember some general managers, of a past age, who carried this to the verge of secretiveness, keeping even their brother officers in ignorance of the "reason why" in issuing their manifestoes. That this was a mistake we need not stay to prove.

An intimate acquaintance with the system of railways, sidings, canals, depots, etc., placed under his charge, if not absolutely necessary, is, at least, of great importance to the General Manager, who, by such knowledge is able at all times to judge for himself more readily in cases affecting the working of traffic which may be submitted for consideration. Something of the nature of an acquaintance with the special traffic or produce of each district is useful to him who has its transit to regulate and provide for, although the departmental officers may be presumed to make that a special study, and to be able to advise him. Next to this branch of information, which the Manager of inquiring habit is certain to cultivate, is a somewhat similar acquaintance with the character and products of his neighbor's territory, and specially with the points of junction with his company's lines; and this will occasionally lead him to the projection of fresh feeders, *now* into untrodden regions lying into his own lines, *then* into unthought-of corners of his neighbor's ground. The former is easy, comparatively, and, if conceived in a generous spirit, is certain to receive support from the district to be traversed, if not from the board. The latter requires *finesse*, to carry conviction to those proposed to be scheduled for land or "amenity," and to keep the secret of the intended invasion from the company in possession until they have no other resource but to oppose the bill in Parliament. When his project reaches that stage, and the decision of a committee of Parliament is solicited, the General Manager of the highest order of capacity and attainment finds his favorite arena. He surrounds himself with his most trusted witnesses, has his confidential consultations with counsel, arranges his evidence, and waits his turn to be examined. In the witness-box he yields himself to a careful and well-prepared examination in chief, cautiously fencing in cross, and offering nothing but what is extorted from him. During the hearing of evidence for the opposition he is untiring in his watchfulness, prompting questions and calling attention to the joints in the enemy's armor at which to point attack. At this time his evenings in the vicinity of Westminster are devoted to consultation, or to the next day's campaign and the arrangements needful for success. If our general managers are highly-paid officers they are not "the right men in the right place" if they do not deserve it. They sleep not on beds of roses, nor often leave official cares behind them when they lock up their cabinets and betake them to the family dinner-table and the quiet joys of home. We know of no class of men so weighted with heavy responsibilities, and we are pleased to think that the railway service has reared so many whose qualities are statesmanlike, and who are worthy of the highest honors in the gift of the Crown. We have endeavored, we fear very inadequately, to describe them and a few of their functions and responsibilities, and to hold them and their high office before the eyes of the young as deserving of their highest regard, and of their most careful imitation. The general managers of the future are in our offices, cultivating their faculties, and acquiring knowledge and experience. Let them look around them and above them for living examples of what they ought to be.

Now, we shall see what kind of work the General Manager requires of his office staff; and on this subject we have to explain that it is not our intention to picture any *one* office, but to give as comprehensive a sketch of the requirements of the office generally as may include the whole. We may begin this section of the subject with the observation that on some of the most extensive systems the service of an *Assistant* Manager is required. To that officer the General Manager relegates a portion of the details of management. As, however, the Assistant Manager's duties are, practically, the Manager's, we need not dwell upon them separately, satisfying ourselves with this one remark, all the more needful here that we have not mentioned it in speaking of the Manager—that the Assistant frequently takes the place of the Manager at the quarterly and other meetings at the Clearing House and elsewhere. Our readers will be aware that Clearing House business is regulated by committees of the traffic officers of the various companies—the general managers, the goods managers and the superintendents—who sit once a quarter in the Clearing House premises, Seymour street, Euston, London. The two latter classes of officers sit in the same week on separate days, the former a few weeks later, to revise and approve the minutes of their proceedings. To be a thoroughly competent Assistant Manager, then, that is, one who, upon occasion, can take up any of the Manager's functions and fulfill them satisfactorily, requires abilities and qualifications of the same order, and the subordinate office is frequently the stepping-stone to the superior. Besides the Assistant Manager, there is, necessarily, a *Principal Assistant*, whose duty is to regulate the office work, distributing it among the members of his staff, and having a general oversight of its performance. This post is usually held by a junior officer of some experience and educational qualifications—one who may be trusted to apprehend clearly and rapidly what is wanted from a few general hints, and who possesses tact, manner, method and arrangement. He is the Manager's right hand, knows everything, hears everything, has a place for everything, and is unfailing in readiness and accuracy. The Manager's time is constantly occupied, and is, therefore, of great value. People call for him. Some *must* see him. A clever tactician will readily discern whether they *ought* to see him, and act accordingly, without giving offense. Directors' meetings for special traffic purposes are sitting, deputations of traders, or of daily travelers, have audience at pre-arranged times, or the Manager calls the departmental officers together in conference. On all these and similar occasions the principal assistant arranges the business, and has all needful papers at hand. In order to be always ready, this officer must have a capable and orderly staff; but he must know everything himself. He must often be his own index to

everything in the office, and that can only be achieved by having "a place for everything, and everything in its place;" and by training his juniors to habits of method and orderliness. He should command the respect of those placed under him by the thoroughness of his knowledge, and will find it lessens his difficulties if he secures their esteem by amiability of temper and disposition. He should add to practical skill in the discharge of his official duties the graces of as broad culture as possible, as the whole *tone* of the office will probably be influenced by his example. In the hands of a really capable, clever and amiable man, this important office may be administered with incalculable benefit to a wide circle of the young and the impressionable in the ranks.

The working staff of the Manager's office should be like the Secretary's staff, fairly if not liberally, educated. They should also, looking to future promotion, be studious in their habits, occupying their leisure in building up and strengthening the fabric of their earlier education. None of us know too much, even in our present spheres, and we cannot predict what may be required of us, or what tests applied to us in the future when promotion offers. The youth who, on leaving school or college, throws aside his books with a relish, and never looks at them again, will never be anything but a machine, a *mechanical clerk*, destined to be governed, never to hold the reins. Next to this general culture, this yearning after improvement, every clerk in a General Manager's office should be a shorthand writer. The enormous quantity and quality of the work devolving upon the Manager, and upon the principal assistant render it necessary to employ shorthand to save time. The Manager frequently dictates important letters and papers in rapid succession to a shorthand clerk for immediate transcription and signature, and the principal assistant would rarely get along without similar aid. In many of the greater services the directors have established classes for instruction in the art, at the company's cost. Where that has not been done, however, earnest lads will be able to help themselves and each other by the use of Mr. Pitman's most excellent books. A neat and swift handwriting is also a needful qualification for a desk in the Manager's office, and a taste for making out statements; while a fair acquaintance with arithmetic, and, as we have already shown, a disposition towards orderliness and method are indispensable.

The youngest members of the staff learn to use the copying press and are taught how to copy neatly and clearly and to take *double* impressions. These latter they learn are required to complete the regular sequence of correspondence which has to be filed past. They also learn to keep the index and the journal of letters received. In our last paper we indicated *how* the index should be kept to be really useful and ready when wanted. The *journal* is a book in which every letter, every document coming into the office is entered as received. Opposite each entry in this book is a consecutive or running number which, with the date, is either stamped or marked upon the document before it is dealt with by the principal assistant. Whatever is done with that document, if it leaves the office, is recorded in the journal, and we may say that the careful and accurate keeping of that book saves much time and vexation. We are aware that the practice of the companies varies greatly as to this book—some of them relegating it to the office-keeper's department, and leaving the duty of keeping it for *all* departments to one person. That system is not, however, so extensively practiced as that which we have described. The reports of accidents on the line, in the workshops, on the station platforms, etc., involving loss of, or damage to, life, either of passenger or official, damage to plant or machinery, etc., are sent by the heads of the departments interested to the General Manager, who deals with the men who caused them, summarily, if the offense or consequence is trifling, or by submitting the matter, after official investigation, to the directors for their decision. The Board of Trade supplies forms for reporting *all* accidents, of whatever kind, to "the Lords of the Privy Council for Trade," and it is the duty of certain members of the Manager's staff to fill these up and send them off. In acknowledging receipt of these documents, the Board of Trade intimates having appointed one of their inspectors—naming him—if they think the accident worthy of inquiry, and asking that suitable arrangements may be made for his gaining access to the place and the men involved. By the time the Board of Trade issues its report, after this inquiry, the papers on the subject in the Manager's office are voluminous, including the reports of the company's own officers, and the correspondence passing between these, and between the Board of Trade and the Manager. That correspondence, equally with all other sets of correspondence and masses of documents, should pass through the index, and be easily accessible. In the case of damage to goods in these accidents, the matter of settlement of claims is left with the Goods Manager; but where passengers have been injured, the arrangement of compensation question is by one company left to a special officer, attached to no particular department; by another to some member of the General Manager's staff, while in other cases the Secretary or the Solicitor, or Assistant Secretary, has charge of the arrangements. We intend, in a future and separate paper, treating this question of compensation fully. While the initiative in train arrangements, and the making up of the company's time tables, is taken by the General Superintendent and the Goods Manager, the General Manager is, in all changes, consulted, and his sanction has to be obtained before the arrangements can be carried into effect. This, however, devolves no work upon the Manager's staff, and we mention it merely as an item of the managerial authority. All agreements with traders and others emanating from the Manager, his principal Assistant and staff, require to keep these numerous and varied documents carefully arranged and docketed if not, indeed, as is most frequently done, posted up in books prepared for the purpose. These are so often wanted for reference that accurate and full indexing is indispensable, and the most painstaking, methodical and intelligent members of the staff are usually detailed to this duty, and also to the work of seeing that the company's acts of Parliament are at all times set in order and easily accessible. A young man anxious to become useful will do well to make himself familiar with the special provisions of each act and its date, and that acquaintance can readily be acquired by a little occasional reading and a few notes. The General Manager, with so many constantly changing distractions, cannot be expected to remember every detail; so that such special knowledge as this must prove a young officer's interest in his work, his aptitude and his thoughtfulness, and be of incalculable service to his chief.

Reports are sent to the General Manager by the Superintendent of the Locomotive Department from time to time of the depreciation of rolling stock and the necessity for renewals, repairs, and additions; by the Resident Engineer of the condition of the line under special weather conditions, such as floods, frosts, snow storms, etc., and calling attention to the need for special powers to meet special emergencies. The General Superintendent or the Telegraph Superintendent reports proposed alterations or additions to the block-signaling arrangements. The Stores Superintendent complains that the departments cannot use certain material which he has had instructions to order for them. The Goods Manager reports deviation of traffic by a competing company, and produces a mass of correspondence to prove that the enemy had stolen a surreptitious march. The company's Superintendent of Horse presents a black list of deaths in the stalls, on the streets, or in the "Convalescent Home." Everybody reports to the General Manager, whose staff must, if they are equal to their positions, learn to lessen his burdens, and help him to overtake everything by *earnest, intelligent, prompt*, and *united* action.—*London Railway Sheet.*

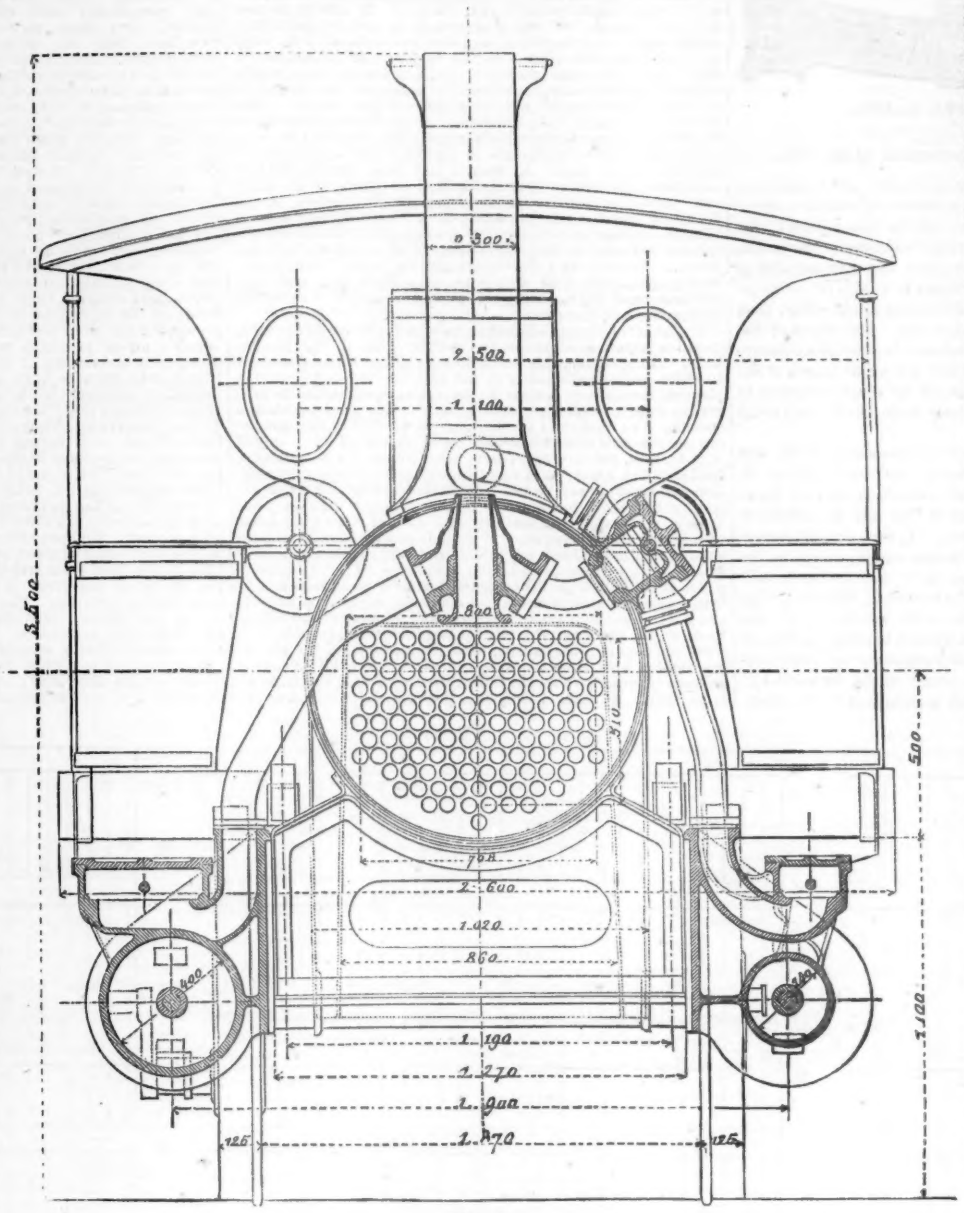

Fig. 1.

THE MALLET COMPOUND LOCOMOTIVE.

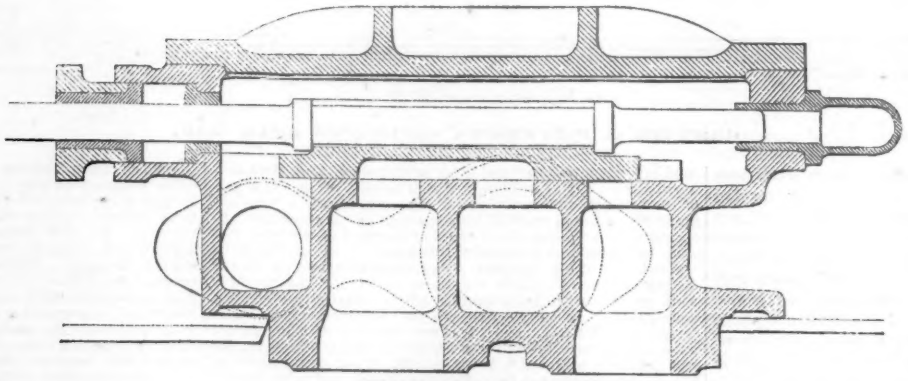

Fig. 2.—Scale 1-5.

Position of Releasing Valve when the Engine is working compound.

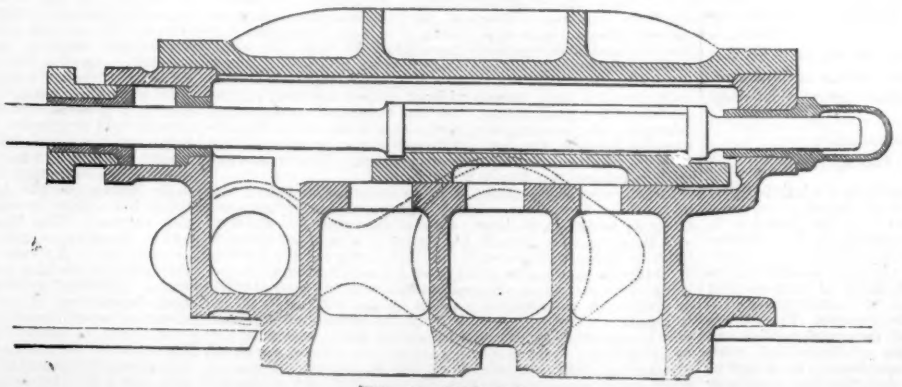

Fig. 3.—Scale 1-5.

Position of Releasing Valve when the Engine is working simple.

Wooden Railroads in Kentucky

Capt. O. C. Bowles has lately completed two wooden railroads, each about three miles long, near Pikeville in Greenup County, Ky., for the purpose of hauling logs out of the woods. On one of these roads he has an engine weighing 6½ tons, which hauls six log cars.

The Mallet Compound Locomotive.

Some two years ago we noticed the fact that a French engineer had designed a locomotive to be worked on the principle of the compound engine so generally used for marine engines, and that some locomotives of this design were to be constructed for a French watering place railroad. The *Revue Industrielle* now gives illustrations and a description of these locomotives, which are presented herewith. The description is translated from an article by M. G. Lestang, in the French journal named above:

The advantages to be realized by the compound system were considerable, but it required experience to establish them, and to reduce to their proper value the theoretical objections which had been made to the proposed arrangement, based, in part, on the instability which the lack of symmetry in the motive organs would occasion, and, in part, on the diminution of the draft resulting from the reduction of the number of cylinders full of steam, or strokes of the exhaust.

The experiment has been made, and we can now see the practical results of the compound principle applied to locomotives. A local railroad with a large traffic (qualities which are rarely found together)—the railroad from Bayonne to Biarritz—is worked entirely with compound locomotives of the Mallet system. The expression "large traffic" seems justified by the existence of a business employing no less than 58 trains daily, amounting to 290 miles run per day.

The road is of standard guage, five miles in length; the profile is quite uneven, and includes for about one-third of the length of the road an almost continuous grade of 79 ft. per mile; the minimum radius of curves is 1,313 ft.

The locomotives, so far three in number, built by Schneider & Co., of Creuzot, are tank engines with three axles, the front are coupled to the main driving or "motor" axle. The cylinders are outside, horizontal, and of different diameters, the smallest on the left of the engine. Fig. 1, representing a transverse section through the smoke-box and the cylinders, indicates the method of communication of these cylinders with each other and with the boiler.

The principal organ is a box fixed on the side of the smoke-box, shown separately in figs. 2 and 3. This box contains a valve moved by hand by means of a screw wheel. This, from its object, is called the "releasing valve." According to the position of this valve the engine works as a compound engine or as an ordinary engine. In fact, in fig. 2, the valve is so placed that the exhaust pipe of the small cylinder communicates by the inside of the valve with the steam supply pipe of the large cylinder; there the engines work compound; in the position shown in fig. 3, on the contrary, the exhaust pipe of the small cylinder is, through the valve, put into communication with the exhaust in the smoke-stack, while the steam from the boiler, arriving by the steam pipe into the box of the release valve, penetrates directly, but by a diminished orifice, into the supply pipe of the large cylinder. Ordinarily the compound operation is used; the direct working for starting or occasionally to overcome temporary resistances which are quite considerable, as on an up grade, for instance. The change from one to the other is made instantaneously and without shock by the movement of the release valve, in charge of the fireman, its handle being on the left of the foot-board, corresponding to the position of the reverse lever.

This apparatus, which moreover is what may be called a fixed piece, like a throttle valve, is the only organ which these engines have more than ordinary locomotives. It can be said, therefore, that not the least complication is introduced due to the compound operation.

The following are the principal dimensions of the locomotive engines of the Bayonne & Biarritz Railroad:

Grate surface	10⅝ square feet.
Fire-box heating surface	49 " "
Total heating surface	480 " "
Diameter of small cylinder	9½ inches.
Diameter of large cylinder	15¾ "
Piston stroke	17¾ "
Diameter of driving wheels	47¼ "
Weight of engine, empty	34,100 pounds.
Weight of engine in service	42,900 "
Weight on driving wheels	33,440 "

Up to this time these compound locomotives have run in the aggregate upwards of 31,000 miles; and during this period there has been no stoppage or delay whatever chargeable to the mode of operation or to the apparatus relating to it. The stability of the engine is perfect with the customary speeds, the maximum of which reaches 25 miles an hour, and the traction is very even, as can be attested by the passengers who make the trip standing on the car platforms, arranged like those of street cars. Further, in the experiments made with the dynamometer on a great line it has been remarked that the oscillations of the dynamometer traction spring were much less with one of the Biarritz engines, expanding to four volumes, than with an ordinary engine with an admission of 30 per cent. of the stroke—that is, making less expansion.

As to the draft, it does not appear to be affected sensibly by the diminution of the exhausts by one-half; the boiler, notwithstanding its diminished proportions, compared with an ordinary engine, supplies the requirements of the apparatus abundantly.

Finally, with regard to fuel consumption, the principal object in view, the success seems to have been complete.

Actually, the average consumption of Cardiff coal is, in round numbers, 14 lbs. per mile for loads hauled of 88,000 to 110,000 lbs., sometimes reaching 132,000 and even 154,000 lbs., over the profile described above at an average speed of 18½ to 21¼ miles per hour. This figure of 14 lbs. per mile is obtained by dividing the total weight of fuel allotted the engines by the total number of miles run, with no deduction for firing up, halts, etc. At the beginning, when trains were lighter, the consumption was only about 13 lbs. per mile or less. On the whole, less than 20 cents is paid for fuel for carrying a distance of five miles a number of passengers sometimes as many as 400.

As the road is worked wholly with compound engines, data are not at hand for a direct comparison with the ordinary system. But if we refer to examples which are similar in regard to loads and grades we are compelled to recognize that this consumption of fuel is very small, and indicates an important economy. The degree of this economy it will soon be possible to calculate more exactly than can be done in any other way, by comparative tests between ordinary engines and an engine of the same pattern transformed into a compound engine simply by modifying its cylinders.

But, meanwhile, it is interesting to chronicle this important fact, that a French railroad is worked regularly, safely and economically exclusively with locomotives in which the steam acts otherwise than in ordinary locomotives, and just as in the most improved stationary and marine engines. This is certainly one of the most interesting innovations that can be recorded in the motive power of railroads.

Train Accidents in November.

The following accidents are included in our record for the month of November:

REAR COLLISIONS.

On the 1st a passenger train on the Vermont Central road ran into the rear of a freight at South Royalton, Vt., damaging the engine and one frieght car.

On the evening of the 1st a passenger train on the Chicago & Northwestern road ran into the rear of a freight which was standing on the track at Turner Junction, Ill. The passenger engine and two freight cars were badly broken and three trainmen hurt. It was snowing at the time and the freight had no signals out.

Early on the morning of the 4th a freight train on the Erie Railway ran into the rear of a preceding freight, which had stopped for water at Lackawaxen, Pa., damaging the engine and four cars.

On the evening of the 4th a freight train on the Erie Railway ran into the rear of a preceding freight which had stopped near Hornellsville, N. Y., on account of a broken wheel. The engine and the caboose were damaged.

On the evening of the 5th a coal train on the Philadelphia & Reading road ran into the rear of another coal train near Mohrsville, Pa. The engine and a number of cars were wrecked and the road blocked three hours.

On the 7th a Rome, Watertown & Ogdensburg passenger train ran into the rear of a New York & Oswego Midland coal train in Oswego, N. Y. The engine and several coal cars were damaged and two trainmen slightly hurt.

On the 8th the rear car of a train on the Raleigh & Augusta Air Line broke loose near Hamlet, N. C., and afterwards ran into the forward cars, doing a little damage and injuring three passengers slightly.

On the afternoon of the 18th a passenger train on the Minneapolis & St. Louis road ran into some flat cars loaded with piles, which had been left standing on the track in Minneapolis, Minn. The engine was damaged and a flat car wrecked.

On the 21st a freight train on the Pittsburgh, Fort Wayne & Chicago road ran into some cars which had broken loose from a preceding train near Homewood, Pa. The engine and several cars were wrecked.

On the 27th a freight train on the Chicago & Lake Huron road ran into the rear of a preceding freight near Schoolcraft, Mich., wrecking several cars and blocking the road some hours.

BUTTING COLLISIONS.

On the morning of the 1st there was a butting collision between an east-bound passenger and a west-bound freight train on the Philadelphia & Erie road, near Ridgeway, Pa. Both engines and several cars were wrecked and thrown down a bank. Both enginemen, a fireman and a brakeman were killed, a fireman fatally hurt, two other trainmen and four passengers less severely injured. It is said that the conductor of the passenger ordered the engineman to run to the upper end of the siding to wait for the freight, but that he kept on and did not stop at the siding.

On the evening of the 1st some cars of a freight train on the New York & New England road broke loose while the train was switching at Franklin, Mass., and ran back down a grade and into the head of a following passenger train. The engine and several cars were badly broken, the engineman and fireman severely hurt and the road blocked four hours.

On the morning of the 3d a number of cars broke loose from a train on the Cumberland & Pennsylvania road, near Frostburg, Md. They ran back down the grade at great speed and into the head of another coal train, doing much damage and killing the engineman.

On the 8th there was a butting collision between two freight trains on the Intercolonial Railway, at Stewiacke, N. S., by which both engines and some cars were damaged.

On the 12th there was a butting collision between two freight trains on the Rome, Watertown & Ogdensburg road at Adams, N. Y., by which both engines were damaged. One of the trains was running pretty fast, although it expected to meet the other at the station.

Early on the morning of the 20th, near Lyons, N. Y., on the New York Central & Hudson River, there was a butting collision between a west-bound freight and an east-bound freight train which had crossed over on the other track to switch a car. Much damage was done to both trains.

On the 21st there was a butting collision between two freight trains on the Illinois Central road, near Ullin, Ill. Both engines were damaged and one man hurt. It is said that one of the trains was running in disregard of orders, which required it to wait at the preceding station.

On the morning of the 25th there was a butting collision between two freight trains on the Atlanta & Charlotte Air Line, near Charlotte, N. C., by which much damage was done.

On the night of the 27th there was a butting collision between two freight trains on the Grand Trunk road near Groveton Junction, N. H. Both engines and several cars were wrecked and one man was badly hurt.

On the morning of the 28th there was a butting collision between a wild engine and a repair train on the Port Jervis & Monticello road, near Oakland, N. Y. Both engines were damaged, a brakeman badly and an engineman slightly hurt.

CROSSING COLLISION.

On the afternoon of the 7th, an express train on the New York, New Haven & Hartford road ran into a switching engine on the New Haven & Northampton, at the crossing of the two roads in New Haven, Conn. Both engines were badly broken, several cars damaged and the track blocked three hours. The flagman at the crossing was not at his post.

DERAILMENT, BROKEN RAIL.

On the night of the 22d the engine and several cars of a freight train on the Missouri, Kansas & Texas road were thrown from the track near Nevada, Mo., by a broken rail. The engine upset and was badly broken; the engineman and fireman were hurt.

DERAILMENTS, DEFECTS IN TRACK.

On the evening of the 8th the engine and one car of a passenger train on the Central Pacific road were thrown from the track near Ogden, Utah, by a defective rail joint.

Late on the night of the 13th the engine and several cars of a passenger train on the Chesapeake & Ohio road were thrown from the track at Anderson's Crossing, Va., by a broken switch rod. Three trainmen were hurt.

On the 23d a number of freight cars on the Boston & Albany road were thrown from the track by a broken frog in the yard at East Albany, N. Y., and some of them were badly broken.

DERAILMENTS, BROKEN AXLE.

On the morning of the 13th the engine of an express train on the Baltimore & Ohio road was thrown from the track near Keyser, W. Va., by a broken axle, delaying the train two hours.

On the afternoon of the 18th a car of a passenger train on the Wabash road was thrown from the track near Fort Wayne, Ind., by the breaking of an axle.

DERAILMENT, BROKEN WHEEL.

On the 23d six cars of a freight train on the Erie Railway were thrown from the track near Deposit, N. Y., by a broken wheel.

DERAILMENTS, BROKEN TRUCK.

On the afternoon of the 7th two cars of a freight train on the New York, New Haven & Hartford road were thrown from the track and down a bank in Meriden, Conn., by the breaking of a truck frame.

On the night of the 9th four cars of a freight train on the New York Central & Hudson River road were thrown from the track near St. Johnsville, N. Y., by the breaking of a truck frame.

DERAILMENTS, BROKEN BRIDGE.

On the afternoon of the 9th the bridge over Grand River at Brantford, Ont., on the Brantford, Norfolk & Port Burwell road, gave way under a passenger train, and the engine and baggage car went down into the river and were wrecked, injuring four trainmen.

On the night of the 11th a passenger train on the Memphis & Little Rock road broke through a trestle bridge near Blackfish Bayou, Ark., wrecking the train and injuring the express messenger severely.

On the afternoon of the 23d a passenger train on the Charlotte, Columbia & Augusta road went through a trestle bridge over Fishing Creek, near Rockhill, S. C., the foundation of which had been undermined by a freshet. The engine crossed over safely, but all the cars went down, some of them being almost entirely submerged. The cars were not very badly damaged; two passengers were drowned and six others slightly hurt.

On the evening of the 24th, as the engine of a coal train on the Pennsylvania Railroad was putting some cars on a high coal siding at Penn Station, Pa., the trestle gave way and the engine fell to the ground. It was not seriously damaged.

DERAILMENTS, SPREADING OF RAILS.

On the afternoon of the 4th two cars of a freight train on the Bradford Branch of the Erie Railway were thrown from the track by the spreading of the rails on a bridge near Bradford, Pa. The cars were badly broken and a number of the bridge ties were broken and torn from their places.

On the 15th seven cars of a freight train on the Winona & St. Peter road were thrown from the track near Chester, Minn., by the spreading of the rails.

On the afternoon of the 20th the engine and two cars of a freight train on the New York Central & Hudson River road were thrown from the track near Port Byron, N. Y., by the spreading of the rails.

On the 24th a passenger train on the Atlantic & Gulf road was thrown from the track by the spreading of the rails. The fireman was killed and a brakeman hurt.

DERAILMENTS, WASH-OUTS AND LAND-SLIDES.

On the morning of the 23d a passenger train on the Atlanta & Charlotte Air Line ran into a wash-out near Pine Hook, S. C. The engine went down into the gap, turning over on its side, and three cars left the track and were damaged. The engineman was killed and the fireman hurt.

On the 25th a construction train on the Long Branch Division of the Central Railroad of New Jersey was thrown from the track by a wash-out near Morgan, N. J. The engine upset and was wrecked and several cars were badly broken; a trackman and a man who was riding on the engine were killed, the engineman, fireman and one laborer hurt. The road had been washed in several places by a storm on the preceding night, and the work train was sent out to discover and repair damages.

DERAILMENTS, CATTLE.

On the afternoon of the 21st a freight train on the Jeffersonville, Madison & Indianapolis road ran over a cow near Henryville, Ind., and the engine and several cars went into the ditch.

On the 28th a passenger train on the Atchison, Topeka & Santa Fe road ran over a cow near Wilder, Kan., and the engine and four cars were thrown from the track.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the night of the 13th a freight train on the Vandalia Line struck a hand-car near Pierron, Ill., throwing the engine and several cars from the track, killing the fireman and injuring a brakeman.

On the night of the 14th several cars of a freight train on the New York Central & Hudson River were thrown from the track by a broken brake-beam, near Chapinville, N. Y.

On the 19th, a wood train on the Detroit & Bay City road struck a hand-car near Columbiaville, Mich., and several cars were thrown from the track, killing one trainman and injuring two others.

On the afternoon of the 19th, the engine of a freight train on the Philadelphia & Reading road was thrown from the track in Reading, Pa., by a stone wedged fast in a frog. The engineman and conductor were hurt.

DERAILMENT, OPEN DRAW.

On the afternoon of the 12th a freight train on the Eastern Railroad ran through an open draw into the Piscataqua River at Goodspeed, N. H., the engine and four cars going down. It is said that the usual signal for the open draw was shown, but the engineman failed to see it.

DERAILMENTS, MISPLACED SWITCH.

On the 10th the engine of a freight train on the Wabash road was thrown from the track by a misplaced switch in Hannibal, Mo., went down a high bank and upset.

On the 13th the engine of a passenger train on the Poughkeepsie, Hartford & Boston road was thrown from the track by a misplaced switch in Poughkeepsie, N. Y. The conductor was fatally hurt.

On the afternoon of the 24th a passenger train on the Montclair & Greenwood Lake road ran off the track near Snake Hill, N. J., damaging the engine, which upset, and blocking the road all night. The engineman was scalded so that he died next day. A freight train was standing on a siding there, and a brakeman, who had opened the switch to let it in, for some unknown reason left it open. He was arrested, but afterwards discharged.

DERAILMENTS WITH MALICIOUS INTENT.

On the morning of the 5th an excursion train on the Fredericton Railway was thrown from the track at Waasis, N. B., by a misplaced switch, damaging several cars and injuring one passenger. The switch had been purposely misplaced, the switch-rod broken and the switch-rail wedged back.

On the 7th an express train on the Savannah & Charleston road ran into some obstructions placed on the track near John's Island Ferry, S. C. The engine and baggage car were thrown from the track and somewhat damaged and the engineman was slightly hurt. A colored man was subsequently arrested for putting the obstructions on the track; he said he had done it because a turkey belonging to him had been killed by a train.

On the evening of the 14th the engine and four cars of a freight train on the Vicksburg & Meridian road were thrown from the track near McRaven's, Miss., by an old rail which some person unknown had laid upon the track. The engineman and fireman were slightly hurt.

On the evening of the 15th a freight train on the Louisville & Nashville road was thrown from the track at Cumberland City, Ky., by a switch which had been purposely misplaced. The engine and several cars were wrecked, the engineman killed and the fireman badly hurt.

On the morning of the 17th a freight train on the Wilmington, Columbia & Augusta road struck some obstructions which had been put on the track near Aiken's Turnout, S. C., and the engine and three cars were thrown from the track, killing the fireman and injuring the engineman.

On the evening of the 17th a passenger train on the Delaware Shore road was thrown from the track at Pennsgrove, N. J., by a misplaced switch. The switch is said to have been purposely set wrong.

On the evening of the 17th a passenger train on the Montgomery & Eufaula road was thrown from the track near Union Springs, Ala., by a switch which had been purposely misplaced. The engine upset and several cars were badly broken. The engineman was so badly scalded that he died a few days afterwards.

On the 18th a freight train on the Valley Branch of the Baltimore & Ohio road was thrown from the track near Harrisonburg, Va., by some obstructions piled up on the rails. The engine was wrecked, and the engineman and fireman killed The

man who placed the obstructions was arrested. The engine upset and several cars were piled up on top of it.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the night of the 2d some cars of a coal train on the Erie Railway ran off the track in Port Jervis, N. Y., blocking the road an hour.

On the night of the 2d a construction train on the Chicago & Northwestern road ran off the track near Afton, Wis., and two cars loaded with iron were piled up on the engine and wrecked. Four trainmen were hurt.

On the morning of the 5th four cars of a passenger train on the Central Pacific road were thrown from the track near Truckee, Nev., and badly damaged, blocking the road seven hours.

On the afternoon of the 6th a train on the Vermont Valley road ran off the track near Putney, Vt., blocking the road several hours.

On the evening of the 7th the baggage car of an express train on the New York, New Haven & Hartford road ran off the track in New Haven, Conn.

On the afternoon of the 7th a freight train on the Intercolonial Railway ran off the track near Folly River, N. S., and several cars ran down a high bank and were wrecked. Some of the cars were loaded with flour and some with oil, and the freight was pretty well mixed.

On the morning of the 8th several cars of a gravel train on the Pennsylvania Railroad ran off the track at Brinton, Pa., and were wrecked, blocking both tracks.

On the 11th an express train on the Grand Trunk Railway ran off the track at Prescott Junction, Ont. The engine and one car were damaged and the express messenger hurt.

On the night of the 11th a passenger train on the International & Great Northern road ran off the track near Palestine, Tex., and two cars went down a bank and were badly broken. Nine persons were hurt, most of them slightly.

On the 14th a construction engine on the Minneapolis & St. Louis road jumped the track near New Richland, Minn. The fireman was caught between the engine and tender and crushed to death.

On the 14th several cars of a freight train on the Chicago, Milwaukee & St. Paul road ran off the track near Brooklyn, Wis., and were wrecked, killing a lot of hogs.

On the morning of the 19th some cars of a freight train on the Intercolonial road ran off the track at Folleigh Lake, N. S.

On the afternoon of the 19th a passenger train on the Ohio & Toledo Railroad ran off the track near Scott, O., blocking the road three hours.

On the night of the 20th some cars of a freight train on the Chicago, Rock Island & Pacific road ran off the track near Trenton, Mo., blocking the road several hours.

On the night of the 22d the engine of a freight train on the Nashville, Chattanooga & St. Louis road was thrown from the track near Nashville, Tenn., and badly damaged, injuring one man.

On the morning of the 24th the engine of a passenger train on the Foxburg, St. Petersburg & Clarion road ran off the track near St. Petersburg, Pa., blocking the road some time.

On the afternoon of the 27th the engine and one car of a passenger train on the Ft. Wayne, Jackson & Saginaw road ran off the track in Bloomingdale, Ind., blocking the road several hours.

On the evening of the 27th the engine of a passenger train on the Detroit, Eel River & Illinois road ran off the track near Columbia City, Ind., and was badly damaged. A fireman was dangerously scalded.

On the 29th six cars of a freight train on the Chicago, Rock Island & Pacific road were thrown from the track near Altoona, Ia., blocking the road several hours.

On the evening of the 29th the rear car of a south-bound passenger train on the Long Branch Division of the Central Railroad of New Jersey jumped the track at a switch near Elizabethport, N. J., and was thrown over violently against the engine of a north-bound train which was standing on a siding, waiting for the other train to pass. The engine was damaged and the car badly broken; five passengers were hurt, two of them seriously. The south-bound train was running very fast.

BOILER ACCIDENTS.

On the 5th the engine of a freight train on the Boston & Albany road burst a flue when near Charlton, Mass., putting out the fire, blowing the fire-box door open and filling the cab with steam.

On the morning of the 20th, as a freight train on the New York Central & Hudson River was near Looneyville, N. Y., a flue in the locomotive boiler collapsed and the steam rushed out into the cab, scalding the fireman badly.

OTHER ACCIDENTS.

On the night of the 8th the engine of an express train on the Pittsburgh Division of the Baltimore & Ohio road broke a parallel rod near Pittsburgh, Pa. The cab was badly damaged and the fireman thrown out and hurt.

On the afternoon of the 12th a connecting rod broke on the engine of a passenger train on the Newark & New York Branch of the Central Railroad of New Jersey, doing some damage and delaying the train.

On the night of the 19th a connecting rod on the engine of a freight train on the Erie Railway broke when the train was near Newburg, N. Y., damaging the engine considerably.

This is a total of 83 accidents, whereby 23 persons were killed and 70 injured. Fifteen accidents caused the death of one or more persons; 21 caused injury less than death, while 47, or 56.6 per cent. of the whole number, caused no injury serious enough to be recorded.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions	10
Butting collisions	10
Crossing collision	1
	— 21
DERAILMENTS:	
Unexplained	20
Broken rail	1
Broken or defective rail-joint	1
Broken switch-rod	1
Broken or defective frog	1
Broken axle	2
Broken wheel	1
Broken truck	2
Broken bridge	4
Spreading of rails	4
Wash-out	2
Cattle on track	2
Accidental obstruction	4
Open draw	1
Misplaced switch	7
Malicious obstruction	4
	— 57
Boiler flues collapsed	2
Broken connecting rod	3
Total	83

Four collisions were caused by trains breaking in two; two by mistakes in giving or taking orders; two by failure to use signals, and one by careless running. There were 28 accidents traced directly to defects or failures of road or equipment. One collision was between passenger trains, six between a passenger and a freight, and 14 between freight trains; 26 derailments were of passenger and 31 of freight or service trains; two of the other accidents were to passenger and three to freight trains.

As compared with November, 1876, there was a decrease of 13 accidents; the number of killed was the same, but that injured was 65 less.

The number of broken bridges is unusual; two of them were trestle bridges, one of which had had its foundations washed out in a freshet. One was a coal siding trestle, hardly to be called a bridge, but one was on a new road and cannot have been standing very long. Spreading of rails is usually a frequent cause of accident at this season, when long rains are apt to soften the road bed, causing ties to sink and spikes to draw out, and the diminished track force on many roads makes it difficult to watch the road as it should be. The running of a train into an open draw does not occur very often, as it should not, for it can result only from carelessness either on the part of draw-watchmen or trainmen. An ugly feature in the month's record is the large number—eight—of malicious derailments. Four of these were caused by obstructions on the track and four by misplaced switches; perhaps these last should be received with some caution, for it is quite possible that a careless trainman's or watchman's fault may be covered up by a story of a switch set wrong by unknown tramps. Even with this allowance it is an unpleasant record. The proportion of collisions is smaller than usual; probably the number of rear collisions might be reduced still more, if more caution were exercised when two or more freight trains are run in groups. It seems now very much as if they were, as a practice, run too close together, hardly giving brakemen time to signal a following train in case of an unexpected stop, or else trainmen are not prompt enough with their signals. In either case there is evidently room for an improvement, and perhaps a more extended use of torpedoes at night or in foggy or stormy weather would be well.

It may be of interest to note that the 21 collisions caused six deaths and injuries to 20 other persons; the 57 derailments killed 17 and injured 48 persons, while the five other accidents injured two persons.

For the year ending with November the record is as follows:

	No. of accidents.	Killed.	Injured.
December	88	94	141
January	147	10	148
February	56	5	41
March	58	9	31
April	69	13	34
May	46	12	41
June	49	18	92
July	53	21	144
August	98	46	220
September	84	20	88
October	82	31	112
November	83	23	70
Totals	913	300	1,162

The averages per day for the month were 2.77 accidents, 0.77 killed, and 2.33 injured; for the year they were 2.50 accidents, 0.82 killed, and 3.18 injured. The average casualties per accident were for the month 0.277 killed and 0.843 injured; for the year, 0.329 killed and 1.272 injured. The number of injured for the month was much smaller than usual in proportion to the number of accidents. The great number of deaths from the Ashtabula accident last December appears this month for the last time to swell the yearly averages.

The Provisions of British Laws for the Protection of Bond and Shareholders.

A few months ago a letter from Mr. John M. Douglas, concerning American railroad management, was published in the London *Times*, and copied in this and many other American papers. This attracted a good deal of attention and some discussion. In the last number of the *Commercial and Financial Chronicle* appears another letter from Mr. Douglas on the English laws for the protection of railroad-security holders, with suggestions as to needed amendments of American laws. This letter we copy below:

I gladly endeavor, on your request, to explain the British system of railway loans without foreclosure powers, and how it would affect American bond and shareholders, taking Erie for an example, as you suggest. I have been from the first a member of the combined reconstruction committee of Erie bond and shareholders, and have seen in detail there, and more generally on other American railroads, the sore evils which have arisen for want of railroad laws sufficient for the requirements of our times. This is no disparagement to your great and intelligent nation, for railroad laws have not been made by Congress, but have been made, without concert, by your numerous States, some very slightly interested, and even the greatest representing only a fraction of the mighty intellect and railway interests of your Union. It is not for strangers to say how your legislation should be gone about. But both American and European investors painfully feel the endless differences and defects of State laws, which only benefit the great operators and railway magnates who make it their business to learn the faults of these patchwork statutes, and thereby to rule the common herd of bondholders and shareholders with a despotism which here would never be borne. The confusion has been increased by acts applying generally, though passed at the instance of individual persons or corporations for their own purposes.

The laws of railways and other incorporated companies were here also originally fragmentary and unsystematic. But after long and large experience, Parliament codified them in 1845, by the "Companies Clauses Consolidation Act," which has worked excellently. Some important additions have been made as required, the last of which have stood nine or ten years' trial with marked success.

I cannot show how our system would affect Erie bond and shareholders in their difficulties, for, under our system, the like could not occur. But I can show how this is, and how both bonds and shares would have been not only preserved from difficulties, but vastly enhanced in value by such safety as is given by our railroad laws. The public, too, would have benefited, not only because it suffers by all waste and wrong, but because a struggling railroad cannot serve the public so well. Our laws are alike for England, Scotland and Ireland, though some of these are passed, as it were, in duplicate, varied only in some legal words, etc., according to the law language and forms of each country.

I. Mortgages in America are at present secured by powers of foreclosure and sale, founded on an actual mortgage, granted just as if the railroad were a farm or a house; but railways differ so greatly in extent, shape, use and value, from any estates previously known, that they needed a new form of security, which was given by our statutes, dispensing with the old forms of mortgaging and registry as incongruous and really inapplicable. The word mortgage, though still employed in our statutes, is not in common parlance applied to our railway bonds, which we call by the equally inexact name of "debentures." They are secured on the revenue only, but primarily and permanently, and on the better lines are now almost wholly replaced by conversion into "debenture stock," that is, perpetual annuities secured exactly in the same way. Except in one or two unfortunately peculiar cases, the loan capital is secured over the whole undertaking, and additions to the undertaking become liable to the debt. This we find ordinarily much safer and cheaper than separate loans. The whole rolling stock and plant are by statute made part of the undertaking, and free from separate conveyances and from seizure by creditors. We have no trustees for the mortgages, and this is one of the great benefits of our statutory forms. Some trustees are very unsatisfactory, and even the best cannot be better than the bondholders themselves. If the interest is not paid, a considerable proportion of bondholders, specified beforehand, can, by combining, get a receiver. The need for such a combined movement by disinterested holders prevents improper applications and secures the selection of a receiver who acts only for his constituents and without jobbery. He works the railroad and applies the net proceeds first in payment of interest on the bonds so far as ranking equally, and then in payment of the principal of the short mortgages, gradually, as funds allow.

Receivers have been needed in few cases. They are strictly held to account by the courts, and, owing to the prevention of floating debt and other complications here, their duties have been comparatively simple and temporary.

In most British companies all the loans rank equally, which makes the securities much more marketable and valuable, being parts of a vast homogeneous whole. Their perpetual debts quoted on London Stock Exchange cannot at present be bought to yield more than 3¾ to 4 per cent., except in the case of one short new railway, which has never yet had any profit and is in default.

Such high values are attained by limiting the proportion of debt to paid share capital, so that there may be a margin of security, and by regulating the manner of incurring debt, so that nothing can be put before the bonds; also providing that bond and shareholders can see all the affairs, can inspect all the books, can easily and cheaply have lists of their co-partners, can see the holding of each, are protected from having their votes swamped by large operators, and can practically control their directors if they please. All these directors must be considerable shareholders; and classification or rotation of directors secures against raids and revolutions. Bonds cannot have proper value nor be safe unless the shares also are protected from raiders and "operators," for the sure income of the shares is the only margin that gives value to the bonds.

Borrowing is forbidden beyond a statutory limit, generally one-third of those shares which are at least half paid up. In exceptionally unlucky cases, as that of the railway in default above mentioned, powers to borrow somewhat more have been given. Bonds take precedence of everything except payment for the land or leases, etc., on which the railway is held. No railway can bind itself for a loan or bill or note, or in any way but by the statutory bonds. Acknowledgments, called "Lloyd's Bonds," have been granted by needy railways for work done or goods supplied as a temporary resource, but these cannot be effectually granted for borrowed money, and do not rank with the statutory bonds. Wages of labor are paid weekly or at most fortnightly, and no question has ever arisen about their precedence, as they cannot fall into arrear. No workman would submit to it. Nor does our law allow any preference for supplies. Thus no legal "floating debt" can exist to trouble the bondholders. Notes of hand are sometimes given, but these are well known by both givers and receivers to be mere debts of honor as regards the companies, so that directors in times of difficulties have had often to become personally bound for enormous sums on behalf of their companies, trusting to the honor and good feeling of their shareholders.

All these provisions have not sufficed to make bonds always valuable. We, like you, had at one time a plague of "contractors' lines," and railways not needed, but got up for the making by speculative engineers, contractors and lawyers, with shares issued on puffing prospectuses, contracts let at monstrous prices and largely paid in shares, etc. These were generally small concerns and were bad from their birth. This plague ceased for want of dupes to supply money. The bonds of some proved almost worthless, but time is bringing a number to have some real value. But some could not go on without a sort of reconstruction, and a law was passed authorizing this on a scheme approved by three-fourths in value of each class of mortgages and preference shareholders, and by a meeting of ordinary shareholders. This requirement of separate consents has prevented any section being taken adantage of. And till people agree, the receiver quietly works the line for payment of the earlier creditors.

II. The real ultimate security for bonds and shares alike lies in as far as possible securing good management. This we do by statutory provisions, mostly now thirty years old, but gradually improved and added to, and really effective, except against those errors of judgment in which the directors and shareholders went wrong together, and which must always be incident to human affairs. The regulations are mainly in the Companies Clauses Consolidation Act and the acts of 1867 and 1868. If they, or something better accomplishing their objects, were made law throughout the United States, they would give American bonds and shares a value like English, for American railways have great advantages over ours, and nothing but the want of such laws has kept down their value. Experience proved here that nothing less than these would give safety here, for they have had to be gradually made more strict and complete. The main points are as follows:

1. Capital cannot be increased either by shares or loans, nor new railways made, nor leases of railways granted or accepted, nor any considerable new works or enterprise undertaken, nor anything except matters of ordinary administration performed without the express authority of the shareholders, given at a meeting held upon postpaid notices sent a week or so before to every shareholder, besides longer notices by advertisement. Most matters have to be approved by at least two, and sometimes three, such meetings, with a considerable interval between, at some of which the approval must be by three-fourths of the votes. This large majority, and the repeated consents for the same object, are important and much-needed safeguards, not only against the managers, but against the shareholders themselves. * *

Had these rules prevailed in New York, the Erie could not have been deluged, as it was, with convertible bonds and shares, manufactured in millions for instant use. No board would have dared to propose them. No shareholders would have passed them. And if these difficulties could be supposed non-existent, the mere time needed for notices and meetings would have made such things impossible.

2. Books and accounts must be well kept and all open for free inspection by all bondholders at all reasonable times, with power to take notes, and by all shareholders for fourteen days before and one month after each ordinary meeting, which in England is half-yearly, instead of being annual, as with you. We think there is an advantage in this shorter period. Anyhow, the shareholders should have access to the accounts and books, at least as much and as often as here.

3. Half-yearly accounts have to be made up in the excellent

statutory form imposed in 1868, and printed seven days before each meeting. These accounts give a very complete and detailed view of the affairs, carefully separating capital and revenue, with a probable estimate of capital outlays to come. Each commences with last half-year's balances, so as to be quite continuous. The accounts are not composed of isolated items; all go into the columns, and are summed up to produce the general balance. The accounts are of a purely practical kind, require no bookkeeping but what a company must have for its own sake, and were formed by taking the best parts from the very various forms used by numerous companies, and adding others. Some (particularly Scotch) companies work into these forms a good deal of extra information, not compulsory, and more might still be usefully introduced. These accounts must be lodged with government and given to every bondholder who asks them, and they are sent by post, with the half yearly report, to every shareholder about a week before the half-yearly meeting. Their uniformity is of the highest value, not only for comparing the doings of different railways, but for watching the doings of one company from half-year to half-year. Till this form was compulsory the companies constantly changed them, just as many American companies still do, with the effect of making comparison impossible.

4. The half-yearly accounts must be reported on, before the half-yearly meeting, by auditors (two in number) appointed, not by the directors, but by the shareholders. One of them retires annually, but may be re-elected. These have no likeness to an American auditor, who here would be styled the accountant of the company. They are paid, but must have no other office or interest in the company's affairs, unless as holders of bonds or shares. Generally, at least one, sometimes both, are public accountants of the very first class; if one is not professional, he is generally an experienced large shareholder. The auditors have at all times access to the company's books, and their report must be laid before the meeting of shareholders before a dividend is declared. They are also entitled to make to the shareholders, at the company's expense, and at any time, any communication which they see fit regarding financial matters.

5. No railway company can pay for shares or bonds in another railway or company, nor spend money on any object outside of its statutory purposes, without special legislative power. If this had been the law in America, some lately prosperous companies would not now be in such trouble.

6. The list of names and addresses of all shareholders is constantly open to each of them, and must be annually printed correctly, and copies sold at five shillings each to shareholders. This enables shareholders to see who are their partners, to communicate together, and on occasion to organize opposition against board measures or men. The knowledge that this can be done makes it rarely needful, and has a constant steadying effect.

7. The voting is not simply by shares, as in America. Generally, there is one vote for every share registered up to ten; then one for every five up to one hundred shares; then one for every ten shares additional. This prevents large holders, speculative or otherwise, from controlling these great concerns. They would need to buy nearly nine-tenths of the shares to be sure of ruling. No one is on any occasion recognized as a shareholder till registered. The registers are closed for a reasonable time before each meeting, to secure their being perfectly written up. The recent difficulties at an Ohio & Mississippi election would be impossible here.

8. Holders of a certain proportion of shares may at any time require the directors to call a meeting of the company, and, if this is not done, may call it themselves. The directors are bound to obey the resolutions of shareholders' meetings.

9. Proxies are only granted for one meeting named in them, and practically are rarely asked or given till the half-year's reports and accounts are received; thus no directorate has in possession the ready voting power which many in America keep continually in hand. It is not wholesome that proxies should be granted in advance, nor till after learning all that has been done and is proposed.

10. Directors are the objects of important rules. (1.) Each must be a substantial shareholder; the amount required varies; in little concerns it is small, but in the larger companies it is considerable. In point of fact the holdings of many directors are enormous. Some large companies publish at each election the holdings of the candidates. (2.) They are paid, though very moderately. (3.) They are, as trustees, prohibited from having any other pay or any contract or profit from the company, unless as shareholders of an incorporated company. This is excepted, because the names and designations of all shareholders in such companies are registered and public; therefore such contract would not be secret, and if it were improper it would lose him both his seat and his character. (4.) One-third retire annually, but may be re-elected. This provision makes raids on railroads impossible, as it would take two years at least before raiders could get control. The Erie raiders got possession of the road, and then made themselves permanent by getting an act for this rotation system, which, in the circumstances, was properly repealed. But no board can be expected to work properly without reasonable certainty of its policy lasting for a time. Some American boards are said to secure this by manipulating shares, and begging, or sometimes buying, permanent proxies; and most of them by excluding both share and bondholders from knowing their own affairs or co-partners. Rotation seems a much more proper way.

On these varied and carefully matured provisions the comparative steadiness and value of English railways depend. They are largely held by investors for a return of from 3½ to 4½ per cent., or a little more, combined with the hope of gradual improvement. Their security does not gain much from the care of Parliament, which may protect one of them from another, but which scarcely ever protects shareholders from their own errors or from those of their directors.

These provisions seem to suit the free spirit of American institutions. In the best old sense of the words, they are democratic and republican, opposed to oligarchy and "personal government." And they are so distinctly conceived and expressed that they have caused scarcely any litigation.

Though I have read many American railroad laws, my knowledge of them is necessarily most imperfect. Yet, I venture to think that no rights would suffer, though all the above were enacted at once in America, except that very important rule as to the scale of voting, which might seriously affect those many railways which control others by holding a majority of their shares, unless *ex post facto* operation were excluded. To disturb the present state of power in these cases might be wrong or right, I don't venture to say which. But if I, seeking a fair return, put money into a railway, and a neighboring railway then buys half the shares to control and work the line, not for its own advantage, but to throw profit on the buying line, I am robbed under form of law. There have been such cases in the past, but there should be none in the future. No company can be taken possession of by another in this country without consent of a three-fourths majority of votes.

In discussing these subjects the great American mileage reported, as compared with the English, will be quoted against change. But the figures don't admit of comparison, for Americans reckon up all double tracks, sidings, stations, etc., as single-track mileage, while the English report only the distance between termini, and through this defect no one knows the total length of track laid, which is vastly greater than appears.

My remarks are longer than I desired, though I have labored hard to compress them, and have excluded many useful details and illustrations. Our system is composed of many parts, each of which, though good in itself, would be ineffective by itself, but combined into a whole they are most efficient. I was therefore obliged to mention all the chief points, though describing them most imperfectly. I know that Americans will at least approve our aims, to protect the weak against the strong, the poor against the rich, the scattered many against the combined and possibly conspiring few, so that small and great investors alike may safely employ their resources in the improvement of our country.

JOHN M. DOUGLAS.

Threadneedle street, London, Nov. 22, 1877.

Railroads and Bankruptcy.

As serious charges are likely to be tried in New York, affecting legislation, especially in conjunction with railway management—and as that management will occupy the attention of State and Federal legislatures, we suggest a subject for consideration. When the London, Chatham & Dover Railway had reached a condition of what appeared hopeless insolvency, some fifteen years ago, the position occupied by a railway as a debtor, was forced on the attention of the British Parliament. Small creditors fearing that their interests might be lost in the mass of indebtedness, sought to secure themselves by attachments; and swearing out debts, took possession of locomotives, carriages, and any movable property at hand. The effect was to stop the operation of the road; indeed such work had but to proceed for it to be torn to pieces, and a more disastrous wreck made of the property than of any ship Cornish coastmen ever lured to destruction. What is meant is, that the return from the pieces, in proportion to the expenditure, would have been even less than from a richly freighted merchantman broken up on the rocks. On the point of economy, then, it was necessary for the legislature to interfere, or an example would have been set of sacrificing great interests to little interests, which followed, would have become national in its disaster. But other considerations made themselves felt, for when a railway in working order was thus neutralized interests all along the line were jeopardized, property sacrificed, and even the conveniences of life interfered with. Not only had Parliament to prevent the waste to which the property would be exposed, were the ordinary rights of creditors in this case allowed, but it had to protect the rights of others, no less sacred than those the creditors endeavored to enforce. A law was therefore hastily passed to stop the proceedings which threatened annihilation to the London, Chatham & Dover Railway, and this was afterwards followed by a matured enactment affecting railway property throughout the Kingdom. It was then laid down that a railway was a public road; that as a Queen's highway it could not be blocked or interfered with; that those it served had a right to the service, apart from the rights of any creditors. At the same time to protect the rights of the creditors, the whole revenue of the road was made liable to confiscation for their benefit. As there is nothing to be derived from a road but its revenue, all that was really valuable was thus secured for the creditor, while the principle of the right of way was laid down so that the question could never be thereafter raised. As a public highway the railway could not be declared bankrupt in the ordinary sense of the word; but, on failure to meet its liabilities a Receiver could be appointed by a Court to take charge of all the revenue, and the jurisdiction extended to seeing that the road was effectively and honestly operated, so that no part of the revenue was diverted from the lawful channel. In practice, this was found to cover every right; while the benefit extended farther;—for it carried the road beyond the chicanery which might seek to bring it to ruin, to serve a nefarious design. The temptation might at any time be brought to bear on a *clique* of directors to thrust a road into bankruptcy, purposely that it should be absorbed into another system; to run roads in opposition, till the shareholders were wrung out, and the mortgagees brought in as the proprietors, when the lines could be amalgamated, and the fortunes made of all concerned. As the railways became thus exempt from bankruptcy, no right appertaining to any one connected with them could be extinguished; and the shares which represented the capital originally issued, were designed to represent it to all time. The stock might be "watered," but the water could never be wrung out. There it remained beyond the power of absorption, and those who chose to hold, and had to hold when the shares became unmarketable, locked them up and left them for a future generation. As remarked in another article, a railway possesses a vitality to be found in no other enterprise, at least to the same extent:—the property of increasing in value with time; of building up its own revenue. No one can therefore say that a railway share must always remain worthless, because now unprofitable, and those who seek to provide for descendants, and have confidence in the growth of particular lines, can lay by such securities, assured at least that the right to the benefit cannot be alienated, were the line to grow up in value to their expectation.

Now this is the railway legislation more required in the American system than in any other; indeed it has been rendered essential, by the tendency developed by speculators and others to carry out nefarious designs through nefarious means. All admit that the United States presents the finest field for railways in the world; that its railway system is the grandest of all properties; hence, all may well be astounded at the fact that it is the land of railroad bankruptcy;—that where Nature has favored their operations so much, more insolvency has occurred than over the rest of the globe. Much of this has been shown to grow out of the management for personal objects, the self-aggrandizement the system has encouraged; the use of the property to forward ends purely selfish, as in the case, for instance, now furnished from Philadelphia by cable. The legislation required should seek above all things to extinguish that tendency; and perhaps no law could be more effectual than in raising the line above the action of any bankruptcy enactment, so far as the right of way is concerned, and leaving the creditor the net revenue when the road fails to meet its obligations. The track and all required to work it as a highway should be preserved in their entirety; and every right as originally purchased should remain inalienable. The management would then be powerless to bring a road to bankruptcy, so as to play into the hand of a designing *clique* who proposed to obtain the wrecked property at their own price. Doubtless, means would be discovered by the skillful operators of Wall street to deal with the stock as suited their purpose; but they would be shorn of their power of working through a dishonest management; and they would have to deal with the stock and other interests created at the start, which would always be found a difficult matter.

It has been said that the management of American railroads is by lawyers and politicians; and that its distinguishing feature is, proceedings in bankruptcy. Perhaps in no other country are those proceedings less satisfactory. The easiest road to fortune is through the wrecking of the line; and the object and end of a thoroughly dishonest management are—bankruptcy and receiverships. Such a law would stop all that; for the receiver would have to deal only with the revenue; so to account for all the sums paid into his hands that the money could not be misappropriated without the direct connivance of the Court. Whatever goes to check the practice of wrecking railways is a material step on the path of reform; and surely the simple means to which we have alluded, and which has proved so efficacious in this country is worth the careful consideration of the legislatures on the other side of the Atlantic at so important a juncture.

If the railways of other lands possess in a remarkable degree the power of building up their own revenues, of creating and nourishing the traffic upon which they live, of increasing year by year in value through the fostering of industry along the track—the roads of the United States must possess this quality in a pre-eminent degree: hence, if it is an injustice elsewhere in extinguishing the right of the original shareholder in favor of the less enterprising investor who followed on the track his predecessor had made, that injustice is intensified there. The common shares of American railways command no confidence, for it is taken for granted that sooner or later they will be sacrificed; yet they ought to be the most valued security of the railways, because it is they which have planted themselves on the ground of the inherent worth, the profitable future. Let an American railway man turn this over in his mind—that the stock which trusts to the rise of the most rising of all countries, to the good and honest management of the most intelligent of nations, should everywhere be regarded as worth so little—and the only security that can command confidence—itself terribly shaken—is the specified contract—the written guarantee involving forfeitures in violation, that certain sums should be paid at certain dates. The confidence to create is the confidence in the stock, the ordinary shares; the belief that what ought to be the most profitable of investments is to be, and that anything less is a slur on the American name. It is this for which the framers of the laws ought to strike, and perhaps the first thing is to make an example of some of the persons who have been instrumental in bringing the management down to the discredit into which it has fallen. There are several points to be suggested from this side in connection with railroad reform, but the most important of these is the measure we have now brought forward. The next is to ensure the publicity of returns, the full proceedings of the direction; that it may be impossible, for instance, for managers of their own volition, and without the knowledge of the public, to add to the share capital, as in the case of the Market Street Car Railway Company of Philadelphia.—*Anglo-American Times, Sept. 28.*

Contributions.

Committees and Volunteers in Technical Societies.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note and approve your remarks upon the subject of the reports of the Master Mechanics' and Master Car-Builders' associations, especially what you say as to the lack of independent research.

As records of experience these ten and eleven reports of the respective associations are of great value; yet on looking them over one is astonished to find so little that is conclusive.

Now this may partly arise from modesty; but chiefly from the mistaken views of those who have served on committees as to what was rightfully to be expected of them. Generally they have seemed to consider that they were only to act as a medium through which facts and opinions upon a given subject were to be gathered and published; although I should understand that they were expected not only to do this, but to draw conclusions and present results. That ten members report that they use rubber springs in draw-bars and eleven report that they use volutes instead of rubber, leaves the question as to the best spring just as open as it was before.

I say, gentlemen on the committees, give us your own opinions and the reasons for them; state what is good and what is bad practice. You will in this way lead to a discussion that will be worth something, and it will not make much difference whether you are right or wrong; for men will at once attack your opinions, giving you a chance to defend them, so that the best information that each one has will be called out.

But the good, solid work of societies for the promotion of knowledge is never done, so far as I have observed, by committees, but by *volunteers;* men who are themselves heartily interested in a subject which they have undertaken to investigate, and whose thoughts naturally dwell upon it, assimilating every fact which they note in conversation, in reading or in experimenting.

Volunteers to the front! Let us hear from you at the next conventions! Let us know whether or not there is a spirit of investigation in these associations, besides that which asks some committee to take up a subject which ought to be inquired into; but as to which each individual is too indifferent to investigate for himself.

ARCHIMEDES STEPHENSON WATT.

CHICAGO, Dec. 15, 1877.

[We concur with what our correspondent says in relation to the effectiveness of individual work compared with that done by committees. In fact, the work which is done by a committee is, in nearly all cases, performed by some one member thereof. The advantage of a committee, however, is that it acts in a measure with the authority of the association by which it is appointed, and, therefore, it finds many avenues of acquiring information open to it which would be closed if a person should apply on his own individual authority alone. The appointment of a committee to investigate any subject is in fact a public request made by the association which appoints it for the information sought. Now if Mr. Jones or Mr. Smith should without any such authority apply for statistics, data, or facts relating to any subject, he would find that he would not be answered as promptly or as generally as he would if he could present his appointment by the association. This applies only to certain kinds of investigations, especially to those whose conclusions require statistics and other similar data to confirm them. There are others which would be obstructed by such an appointment, and in making them a person acting alone and on his own responsibility would accomplish much more than he would if he was either the whole or a part of a committee. Nevertheless, volunteers are much needed to do work in both the associations referred to.—EDITOR RAILROAD GAZETTE.]

—It is reported that A. H. Morrison, General Manager, and Joel H. Wicker, Treasurer of the Dakota Southern, have resigned their positions, having sold out their interest in the road.

RAILROAD GAZETTE

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Editorial Announcements.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

RAILROAD APPORTIONMENT SCHEMES.

III.

The plans for dividing traffic described in the two preceding articles have had regard to a comparatively simple traffic, between few termini, and effecting a not very large number of roads, and the plans themselves are simple, in one case employing no machinery or organization whatever, and in the other putting the work of division on outside parties, who are supposed to gain greatly by effecting it, even at some expense and inconvenience to themselves. These examples have probably proved sufficiently the great advantage of an apportionment as compared with unrestricted competition, and its practicability for a simple traffic for which a small number of lines compete. But however well they may have served to show the advantage of a division of traffic by consent, they have hardly demonstrated its practicability for a complicated traffic, covering a great number of shipping and receiving statistics and many different roads with very unequal interests in the traffic competed for. A contract to divide the traffic between two places among the several lines which connect those places, when once agreed upon, will almost execute itself if the parties to it are reasonably straightforward, especially if there is little difference between the routes; but a contract to divide the traffic between a score or two of places, by vastly different roads, is not so easily executed. It can only be made by extended negotiations, and the number of questions coming up from time to time, and the difficulty of getting together all the parties to settle each particular case, make it indispensable that there should be some organization and some central office to collect and distribute the information which serves as the basis for conclusions and action, and serve as a disinterested common representative, giving instructions as to the acts necessary to effect the division agreed upon, and arbitrating between the parties when they cannot agree of themselves.

THE SOUTHERN RAILWAY AND STEAMSHIP ASSOCIATION.

This is the most complex of all the apportionment arrangements now in existence. The number of parties to it when made in its present form was twenty-three; it covers the competitive traffic in both directions to and from a large number of places; some of the roads had no interest in the business of some of the places, and some had very little at one and a great deal at others; there were but two competitors for the traffic of some places, and several for others; it was intended to cover most of the competing points in the South from North Carolina on the north southwest to or nearly to Mississippi—the shipments of cotton from them and the shipments of merchandise from Northern cities to them. That is, it was intended to cover, so far as possible, the entire competitive traffic of a considerable territory.

Going back to the origin of the Southern Railway and Steamship Association, we find that it antedates the live-stock and petroleum apportionments described last week. An agreement was made between companies, including some plan for the division of business, as early as December, 1874. The agreement, we beileve, was not carried out at all until the next May, when a clearing-house agent was appointed, who did indeed receive reports and keep records which showed what the several roads ought to have done to carry out the agreement; but they did not then take any action under it.

This predecessor of the present association seems to have been formed almost as a last resort of the Southern railroad companies. At best their traffic, competitive and other, is light—much lighter than is common on Southern roads, except in half-settled districts. Their number had been considerably increased since the war, and some of the new roads were constructed chiefly to secure the through traffic, and at least were compelled to depend chiefly upon that traffic for support, having very little local traffic. The addition of these new competitors in a field where the supply of transportation was already greatly in excess of the demand, naturally caused a desperate struggle for business. It was carried to great length, and though it probably never forced down rates to the figures which have often been known on Northern roads, these rates were probably quite as low compared with the normal rate on those roads—the rate which, with the volume of traffic obtainable, would pay the expenses of carriage and a moderate interest on the capital of the cheaper roads.

The present organization of the Southern Railway and Steamship Association was formed at a convention at Atlanta, Ga., Sept. 16 and 17, 1875, and the agreement upon which it is based is dated Sept. 17. The basis of the agreement was one suggested by Mr. Albert Fink, and the result of wide investigation and profound study by him, for which his knowledge of principles and long practical experience especially qualified him. And this agreement, the constitution, as it were, under which the Association has its existence, distinguishes this combination from those heretofore referred to even more than the complexity of the business involved and the number of parties to the contract. The Omaha pool in its essence is a scheme for the division of net earnings, or as regards a part of the traffic, of gross earnings, from a certain traffic carried by three different roads. The live-stock and petroleum apportionments are plans for the division of certain branches of traffic among the contracting parties; but the fundamental agreement of the Southern Railway and Steamship Association does not provide for any division of traffic or earnings, but only a method of making such divisions, or of bringing about and executing any settlement whatsoever that the parties may determine upon. It may be a division of traffic, like the present New York apportionment, on a division of gross earnings, like that at present made by the Southwestern Rate Association, or a division of net earnings, which is substantially the method actually adopted by the parties to the Omaha pool and the Colorado pool; or it may be any other plan. That is, the agreement, articles of association, constitution, or whatever we may call it, provides for the general solution of difficulties of whatever nature that may arise among the member, or between any two of them. The establishment of the association was not a settlement of any questions ot issue between the members. It was simply the provision of a method by which they should be settled hereafter—a government, as it were, with a legislature to make laws, an administration to see to their execution, and a court to try and decide differences. This the reader should bear in mind. Combinations of the kind are often spoken of as a "freight pool," a "traffic pool," a "gross earnings pool," or a "net earnings pool." But the distinguishing feature of this association is not the thing done, but the means employed for doing it.

The agreement and rules of the Southern Railway and Steamship Association were published in the *Railroad Gazette* of April 7, 1876, accompanying a letter from Mr. Albert Fink, who was the General Commissioner, or chief officer, for the first six months of its existence under the agreement suggested by him. Mr. Fink's letter, which is also published with his contributions to the late report of the Bureau of Internal Commerce (page 13 of Appendix), where also may be found the articles of agreement (page 16). Referring to these for a full explanation of the method in which this association proceeds, we quote here only a few paragraphs from Mr. Fink's letter, which will show the functions of the central office and its chief officer:

"* * * It will be seen that the members agree merely upon a specific mode or system in which they propose to transact that portion of their business in which they may be cancerned together, and in the proper conduct of which negotiations and co-operation become necessary.

"Articles 4 to 13 provide for the manner in which the regulations and rules for the conduct of the business are to be established, or changed from time to time as occasion may require, also for the appointment of an officer who is to be called the General Commissioner, and whose duties are prescribed in article 14 to 27.

These duties are of a threefold nature:

"1st. The General Commissioner is the head of a bureau through which the members transact all their business of the character named above.

"This bureau becomes the central office of the members. Instead of each company attempting to transact directly its business with every other, almost an impossible undertaking when many companies are concerned (there are twenty-five members of the Association), they correspond directly with this central office and carry on their intercourse and negotiations through it. This avoids, to a great degree, the necessity of transacting business through conventions—an expensive, time-consuming, and at best a very unsatisfactory mode especially as these conventions can only be held periodically, while business can be transacted with great promptness through the bureau at all times.

"In this respect, even without any further measures, the establishment of a bureau by transportation companies having intimate business relations would be a great improvement in facilitating their intercourse, and lead to a more intelligent and satisfactory management of their business.

"The information collected by the bureau upon all subjects that can bear upon the negotiations and subjects of co-operation enables the Commissioner to take a more general view of the whole field of operations, and to form a more intelligent, impartial and correct judgment of the course which it would be best for each company to pursue, with due regard to the rights of others. Acting as an adviser and mediator between the members, many complications, which in intricate and complicated business transactions (especially between parties living far apart) arise from a want of proper understanding, can be thus avoided.

"2d. If the necessary agreements cannot be reached in the manner proposed, the General Commissioner is to decide as an umpire all questions of conflict between the members, and thus avoid the expensive warfare now generally resorted to in such cases.

"His decisions are subject to be revised by a court of appeal or board of arbitration.

"3d. It is the duty of the General Commissioner to see that all the agreements which have been made, or his decisions, or the decisions of the court of appeal, are carried out.

"Agreements between railroad companies are generally made in conventions of the officers. For want of time they are hardly ever thoroughly considered, and are generally understood differently by different parties, and executed as they are understood; hence they are generally broken as soon as made. The impossibility of carrying out agreements between railroad companies is not always the result of bad faith or dishonesty on the part of the contracting parties, but is frequently due to the want of a proper organization and to the employment of improper means to accomplish the end in view. It should not be expected that an agreement made between a great many parties in regard to complicated business transactions can be carried out without some executive head, whose duty it is to see that each party adheres to it, or to fix the responsibility in case of violation.

"It is with a view to correct this defect in the present mode of transacting business between railroad companies that the General Commissioner is made the executive officer, charged with the duty and empowered to enforce the agreements made between the members of the association.

"While this does not prevent intentional violation, yet it removes many of the causes which lead to disagreement and disruption. In the course of time it may be expected that by these means confidence between the members will be established, the want of which in each other is really one of the greatest causes of dissension and trouble.

"These three specific duties of the General Commissioner, which I have named above, are to be performed by an officer of experience, accustomed to deal with all questions arising in the practical management of the transportation business. This officer should at least be the equal, in intelligence and capacity, of the chief managing officers of the railroad companies members of the association."

Leaving now the machinery of the association, which is of special interest in this case as being designed for general application, we come to the work done—to the laws passed under this constitution, and the administration of them.

The General Commissioner (Mr. Fink) having been appointed, and each member of the association having made him its agent for conducting the competitive business in which it was interested in common with other members, a classification and tariff were established, and certain divisions of business agreed upon for the different competing points, on cotton shipped North and on merchandise received from Eastern cities. This made a large number of apportionments, for not only were there several places, but the merchandise business was not usually divided in the same proportions as the cotton, and that from Boston perhaps differently from that from New York, Baltimore or Philadelphia. For instance, cotton shipments from Atlanta were divided among five roads in these proportions: 31.7, 31.7, 15.8, 15.8 and 5 per cent., while the merchandise shipped from Eastern cities (all alike) was divided among four roads in these other proportions: 26⅔, 40, 16⅔ and 16⅔. Again, the Augusta business was divided as follows (in percentages of total):

	Railroad.		
	Cen. of Ga.	S. C.	C. C. & A.
Cotton for Eastern cities north of Norfolk	27	33	40
Merchandise from Eastern cities—			
From Boston	35	35	30
" New York	33	52	15
" Philadelphia	30	50	20
" Baltimore	20	38	42

Running the eye down the perpendicular columns we find that no road got the same proportion of one branch of traffic as of any of the other four mentioned.

It was intended that the *earnings* should be divided as agreed, but that this division should be effected as far as possible by a division of *traffic* in those proportions, in order to lessen the balance to be paid in money. There was not, however, any transfer of freight from one road to another, as now occurs at New

York. But if any road carried more than its proportion of freight in any given month, it was required, after reserving to itself half a cent per ton per mile as the nominal expense of doing the work, to turn over the balance of the receipt from that freight to the companies not receiving their proportion. The allowance for expenses was considerably below cost, so that it was for the interest of every company to carry no more than its proportion. When the reports showed it to have carried more, it virtually went out of the market, not by carting its freight to another road, nor by refusing consignments, but by raising its rates above the regular tariff, which of course led shippers to take their freight where they could get better terms.

This, of course, made it necessary to report the business of each road at each place where there was a division to the central office, and to send summaries of these reports of traffic to the several companies and agencies, that each might know whether it had obtained too much or too little traffic. This office became therefore substantially a clearing house of traffic. Everything was done that a clearing house would do except the handling of the money. Now the possession of the money greatly strengthens such a combination, for it at once puts it in the power of the executive to carry out the terms of the agreement promptly and exactly; but there is an enormous advantage in the simple records, even where no money passes through the central office. It gives, and frequently for the first time, all the parties exact information of the amount and value of the traffic for which they have been competing—a knowledge which, one would think, would in many cases of itself prevent any future reductions of rates or great exertions of any kind to secure the traffic of some of the places. One of the towns at which merchandise from Eastern cities was divided received little more than seven full car-loads during the first three months and a half of the working of the Association—about 1,400 lbs. daily, bringing a *gross* income to the roads concerned of $14 per day, over several hundred miles of road. This information of course is an incident of any division of business. The traffic cannot be divided until it is known what it is. There are many places, of course, where one does not need the figures to know that the traffic is valuable, and is worth making special exertions and considerable expenditures to secure; but there are only too many whose traffic is somehow supposed to be worth fighting for, and securing at the risk of endangering the profits on nearly all through traffic, but which is really inconsiderable. In such cases it seems to be assumed by one railroad that, though it has no large business there, its rivals must have an enormous one. At least it is not easy to account for the conduct of some lines on any other hypothesis.

The association did not find it all fair-weather sailing, however. There seems to have been very little difficulty in agreeing upon the divisions at the several points, or in subscribing to the terms of the agreement. But some of the parties seemed absolutely incapable of loosing their hold on any money that had once come into their possession. If a balance was due from them at the monthly settlement, they could not be induced to pay it over. Conflict resulted and a war of rates within the Association, which, by the way, can serve a purpose in war as well as in peace, and may continue to exist when but two of an original twenty members remain. Very strong language has been used by the General Commissioner (Mr. Virgil Powers, since Mr. Fink's resignation in the spring of 1876) concerning the utter want of good faith of some of the members. These obstacles, however, never destroyed the Association; though its usefulness must have been greatly limited by them, it still seems to have approved itself highly to nearly all the members, who not only continued it, but last September secured the adoption of an amendment to the rules, according to which twenty per cent. of the amount of the freight is paid in to the General Commissioner, and so serves as security for the payment of balances. This seems to have given the association the needful vigor. Afterwards, its action in reducing rates to war prices had the effect of bringing to terms some outside lines which had refused to abide by association rates, and the plan seems now to work effectively and smoothly.

THE TRANSPORTATION OF EXPLOSIVES.

That the public is exposed to much danger, and that railroad managers knowingly or unknowingly assume a great deal of risk from the transportation of explosives, there can hardly be any doubt. It is also probably true that the danger is very much increased by the ignorance and the consequent superstition almost with which these materials are regarded. This is especially true of the new explosives, which are, most of them, compounds of nitro-glycerine, the nature of which is very imperfectly understood by all excepting experts, and even their testimony is sometimes contradictory. The evil effect of this ignorance is due perhaps not so much to actual blunders and mistakes resulting therefrom as to the fact that an unreasonable apprehension is caused by such ignorance, and consequently the transportation of such dangerous commodities is not permitted under conditions which would be quite safe, and therefore they are often shipped surreptitiously, or without adopting any precautions whatsoever.

The October number of *Van Nostrand's Engineering Magazine* contains a very interesting and valuable article on the subject, which is quite too long for us to republish, but which contains a number of statements of fact, which every railroad manager should be acquainted with, and which in forming any opinions, or in taking any action relating to the transportation of explosives, of certain kinds, it is of the utmost importance should either be proved or disproved. The New York *Herald* of last Sunday also contains an article which purports to give the opinions of a number of persons, interested in the manufacture of explosives, concerning either the safety or danger of carrying such materials on railroads. Both of the articles referred to discuss the transportation of nitro-glycerine and its compounds almost exclusively; the nature and danger of carrying ordinary gunpowder are assumed to be perfectly well understood. The writers might, no doubt, recall to most of their readers recollections of singed eye-brows or scorched fingers, which in the days of their boyhood taught lessons on this subject which no amount of writing could equal in impressiveness.

The high explosive powders, we believe, are all compounds of nitro-glycerine. They are said to vary in strength from ten times that of ordinary blasting powder downwards. By their use the cost of blasting, especially in hard rock, is very much reduced. They are very largely used in the mines in the far Western States and territories, and also in mines in the Eastern States, so that their consumption in this country is estimated at about five million pounds per year. It is therefore obvious that every requisite facility for their transportation should be given which is consistent with the safety of the public and of those with whom it is brought into proximity while in transit.

Nitro-glycerine is described as a "light-colored, oily liquid, about 50 per cent. heavier than water," and not soluble in the latter. "It does not explode by fire like gun-powder, gun-cotton and the fulminates. With fire it behaves very much like whale oil. At ordinary temperatures it does not burn by itself. It must have something in the nature of a wick to aid combustion. Touch it with a match, a live coal or a red-hot iron, and it burns so long as the contact is maintained, but when these things are withdrawn the combustion ceases. It is readily explodible by mechanical *percussion, concussion, jar, shock, blow, or vibration. This is why it is so extremely dangerous.*"

A number of cases of serious accidents are cited to illustrate this truth; one of a boy who threw a stone at a can of it, and was killed by the explosion. In another instance a case of it fell the distance between decks on a steamer at Aspinwall, and exploded, killing forty-seven people and destroying a million dollars' worth of property. It is unnecessary to cite more cases. It is enough that it is clearly pointed out that the handling of nitro-glycerine in a liquid form is attended with the most imminent danger, unless the most careful precautions are observed, of which there is a long list in the form of rules, laid down by Mr. Mowbray, who is a manufacturer of nitro-glycerine, which rules those who handle it are warned to observe. Besides this it is stated that unless nitro-glycerine is entirely freed from acid during the process of manufacture, it is liable to "voluntary decomposition." Two disastrous explosions are cited as instances which were doubtless due to this cause. For these reasons the writer comes to the obviously natural conclusion "*that nitro-glycerine ought not to be stored, transported or used in the liquid state.*"

How then may it be made safe? In answer to this he calls attention to the fact, which the juvenile pyrotechnic experience of most readers will confirm, that if ordinary gunpowder is mixed with any pulverized substance, like sand or ashes, its rate of combustion or explosion will be very much retarded. In other words, gunpowder becomes inexplosive by treating it in this way and is thus rendered comparatively dangerless.

What the writer calls the "dynamite invention" "consists broadly in mixing nitro-glycerine with any dry, pulverized, solid substance, in such proportions that on the one hand the mixture will be an effective explosive powder, and on the other hand will not leak or part with any portion of its nitro-glycerine." Such combinations are known by the general name of dynamite, but have different names assigned to them according to the fancy of the manufacturers. If a very small quantity, say one ounce, of nitro-glycerine is mixed with a large quantity, say a pound, of the pulverized material, then it will be impossible to explode it. If the quantity of nitro-glycerine is increased, a mixture will soon be found which can be exploded with the ordinary means employed for that purpose. Before describing the latter, a broad distinction between the nature of gun and common blasting powder should be pointed out.

If we touch dry gunpowder, unmixed with other substances, with a match or red-hot iron, it will explode, no matter how it is situated, whether confined as in a cannon or drill hole, whether packed in cans or boxes, or lying loose in the open air. An *igniting temperature* will always explode it. Nitro-glycerine, on the other hand, is not explodible by such means, but any *severe pressure* will explode it. Thus if a quantity is put into a cylinder, fitted with a piston, and the latter be driven down on the nitro-glycerine, it will explode. Whether it can be exploded by what may be called static pressure, as that produced by a hydraulic ram, is not stated; but probably if the pressure had a sufficient amount of intensity it would have an explosive effect. If a small quantity is placed on an anvil and it is struck with a hammer, it will explode. Owing to the fact that intense pressure is required, it is therefore necessary to employ that means of exploding it in actual use. In blasting rock this pressure is produced by using what is called an "*exploder*," which is simply a large percussion cap. This is not fired by percussion, but by a fuse or electric wires. The explosion of this cap produces the requisite pressure or force on the nitro-glycerine or dynamite in the drill-hole to cause it to explode. To compare the action of gunpowder and nitro-glycerine still further, suppose a layer of gunpowder, say an inch thick, be placed on an anvil and a red-hot iron be touched to it it will explode instantly. If a thin film of pure nitro-glycerine be put on the anvil, and it is struck with a hammer, it also will explode instantly, but if the gunpowder or nitro-glycerine is mixed with a suitable pulverized material, neither the hot iron nor the blow will explode it, unless the layer of what would then be dynamite is thin, in which case that immediately under the face of the hammer might explode, but the other portions would then be blown off of the anvil without exploding. If, however, what may be called the diluted gunpowder is heated up gradually, so that it all reaches an igniting temperature simultaneously, it will explode, and so if the diluted nitro-glycerine is all subjected to an igniting pressure simultaneously, as it would be by the explosion of a cap in a drill-hole, it will also explode. If, however, we put a film of nitro-glycerine on a plate of india-rubber and strike it with a hammer, it will not explode, because the rubber yields under the hammer, so that the requisite intensity of pressure necessary to cause explosion cannot be produced. If a film of nitro-glycerine is placed between successive layers of iron plates and the top one is struck with a hammer, each film will be exploded, but if it is placed between plates of soft rubber, then none will be exploded by the blow.

"Here is the whole secret of the dynamite invention. When an absorbent is used it acts like these soft plates in separating, cushioning and protecting the nitro-glycerine, and making it safe against mechanical blows." That is, a blow at one point is resisted by the soft, yielding absorbent, so that the dynamite will not explode unless special means are taken to confine it, and thus produce an igniting pressure through or on the whole mass, as would be the case if it were confined in a metallic cylinder fitted with a piston, and the latter were driven down on the dynamite, or as occurs in a drill hole when a cap is exploded in it, which produces a tremendous pressure on the whole mass and causes it to explode simultaneously, just as the diluted gunpowder can be made to explode if the whole of it is heated to a sufficiently high temperature. If then the nitro-glycerine is mixed with some absorbent so that under ordinary circumstances it will be impossible to subject it to an explosive pressure, it is said that it will be safe. For this reason there is less danger in carrying it, when thus mixed with an absorbent, if packed in wooden boxes than when packed in iron cases. In the one case it would be more closely confined and be more liable to violent shock, owing to the greater rigidity of the iron case.

If the proportion of the liquid nitro-glycerine to the absorbent which is used is so great that the former is liable to drain out of the latter, then of course its transportation is attended with the same danger, because the nitro-glycerine which drains out is in the same condition as though it had never been mixed with an absorbent. "Leaky" powders are therefore as dangerous as the liquid nitro-glycerine itself.

In the article from which the above facts have been abstracted, it is also stated that both nitro-glycerine and its compounds explode easier as its temperature is higher. At 32 degrees Fahrenheit it explodes with great difficulty. For this reason Mr. Mowbray freezes the liquid to make it safe in handling and transport.

There are, however, two points which have not been made clear in the article which has supplied most of the material for what we have written. It is said that if the liquid nitro-glycerine is not freed from acids it is liable to "voluntary decomposition." In the *Herald* article, already referred to, a writer on this subject is quoted as saying: "It is also liable, in certain cases, to decomposition, yielding gases which exert a pressure within the containing vessel and creating a condition of perilous sensitiveness to external shocks." Now this is asserted of the liquid nitro-glycerine, but nothing is said to indicate whether in the form of dynamite or other explosive powders it is not also liable to similar chemical action. It is said, it is true, that this decomposition is due to the presence of acids, but when a transportation agent receives a car-load of such explosives

what means has he of knowing whether they contain a dangerous amount of acid or not?

Mr. Reynolds, the Superintendent of the Miners' Powder Company, is reported in the *Herald* as saying: "I can demonstrate to a certainty that friction will as surely produce explosion in the congealed article." Mr. Warren, one of the scientific experts concerned in the Hell Gate explosion, says that "dynamite, which is infusorial earth or microscopic shells, mixed with this compound, absorbing and making a sponge of it instead of a liquid, will explode by friction." Now, while this may be true, the practical question in relation to its transportation is, whether while in course of transportation, it is possible to apply friction under the conditions which would be required to cause an explosion, and if so, whether it would not be possible, either by a more secure method of packing the explosives, or by some other means, to eliminate this risk.

As explained above, the method employed in actual use for firing these explosives is a large percussion cap or "exploder." The sudden production of gas by the firing of the cap produces in the drill hole a pressure which causes the powder to explode. These caps or exploders are always liable to be exploded by a blow or shock, and therefore their proximity to nitro-glycerine or any of its compounds is attended with very imminent danger; and for this reason, under no circumstances whatever should they ever be permitted to be shipped in the same car or the same train with any explosive powders.

These considerations have therefore led the writer in *Van Nostrand's Magazine* to the following conclusions, which we are obliged to summarize:

First. The transportation of liquid nitro-glycerine, and, what is substantially the same thing, leaky compounds of it, should be absolutely prohibited on public conveyances.

Second. The dry and safe powders should be carried on all public freight, but not on passenger conveyances.

Third. The powders ought not to be packed in metallic cases, and each case should be marked on the outside with the name of the contents.

Fourth. "Percussion caps or exploders, or other things whose explosion by fire will explode the powders, ought not to be transported in conjunction with them."

As the risk of explosive decomposition and leakage are all very much diminished as the temperature is lowered, we will add the recommendation, that such explosives always be shipped in refrigerator cars, supplied with ice to keep the temperature as low as possible. Such cars are always supplied with double sides and doors, and therefore the contents are more protected from sudden shock and fire than in ordinary cars.

There are, however, still two elements of uncertainty, to which the manufacturers of these explosives must give a satisfactory answer before they can expect all apprehensions to be allayed in the minds of those who are responsible for or are exposed to the danger of transporting these commodities. These are:

First, Whether such explosives are liable to "voluntary decomposition," and

Second, Whether they can be exploded by friction or shocks or other influences to which they are exposed if ordinary care is exercised in their transportation.

The two articles from which we have quoted seem to indicate that unless the powders are confined in some way, as in iron cases, so that they can be subjected to pressure, they cannot explode. If this is true, then it would simply become a question of the kind of case in which they should be packed, which might be of light wood, paper or similar material. If it can be shown that there is no risk from the two sources indicated, then it would seem that the transportation of these explosives would be much safer than that of ordinary gunpowder, and under proper regulations, similar to those suggested, it could be carried on with a risk so extremely remote as to make the traffic in them practically safe to the public. Complaint is made that the present Congressional enactments actually increase instead of diminishing the danger; that they were framed under a misapprehension of the real facts and nature of the explosives that are now manufactured; that they permit the transportation of liquid nitro-glycerine, which should be entirely prohibited, and specify that it and all compounds thereof shall be packed in metallic cases, which should also be prohibited. Like the old query "Does saltpetre explode?" that which may now be asked is, Does dynamite decompose and is pressure absolutely necessary to cause it to explode?

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Olean, Bradford & Warren.—The first track is laid from Bradford, Pa., northeast to Tarport, 5 miles. It of 3 ft. gauge.

Kansas Central.—Extended from Soldier Creek, Kan., westward to Onaga, 12 miles. It is of 3 ft. gauge.

This is a total of 17 miles of new railroad, making 1,994 miles completed in the United States in 1877, against 2,233 miles reported for the corresponding period in 1876, 1,264 in 1875, 1,808 in 1874, 3,606 in 1873, and 7,065 in 1872.

NEW PUBLICATIONS.

We have received the following:

The Application of Electricity to Railway Working, by Wm. Edward Langdon. London and New York: Macmillan & Co.

Mechanics of Ventilation, by George W. Rafter, C. E. New York: D. Van Nostrand.

A Manual of the Mechanics of Engineering and of the Construction of Machines, Vol. II., by Dr. Phil. Julius Weisbach. Translated by A. Jay Du Bois, Ph. D. New York: John Wiley & Sons.

THE BRITISH "AMALGAMATED SOCIETY OF RAILWAY SERVANTS," which includes men in all the operating departments, except clerks, numbered at the close of 1876, 13,440 men, which it estimates to be about one-fourth of the total number of men of the same classes. The number increased slightly in 1876. It seems to have a very fluctuating membership, for 3,475 were dropped from the Association that year and 4,098 admitted. Evidently it is not so firmly established as is the Brotherhood of Locomotive Engineers in this country. The society has 197 branches in different parts of the Kingdom. The association had an income of about $43,800, and expended about $19,900. It had a balance on hand at the close of 1876 amounting to $81,160. The expenditures for "benefits to members" and for "orphanage" absorbed $7,750, and the rest of the expenditure was chiefly for current expenses. The association sometimes affords legal assistance to members, chiefly in prosecutions for compensation for injury, and for defense when criminally prosecuted for negligence. It expended $2,150 for this purpose in 1876, prosecuting successfully six claims for compensation for loss by death or injury, and seven for the recovery of wages, and unsuccessfully one case for the recovery of wages. It defended 10 criminal prosecutions, all resulting in acquittal, besides two cases in which manslaughter was charged, arising from collisions, and both successfully. Also legal assistance was furnished at seven inquests. In one only of these did the verdict implicate an employe. In this one case a station-master was charged with manslaughter, and afterwards tried and convicted.

So far this association has never struck. It has urged the attention of Government officials and Parliament to the dangers attending the railroad service, asked for changes in the laws limiting compensation for injuries in employes, and made many complaints of overwork, bad treatment, etc. A weekly newspaper is published in its interest, but, we believe, not at its cost. The proprietor is, we understand, Mr. M. T. Bass, the great Burton brewer, who for some reason takes a special interest in railroad employes as a class.

THE PROTECTION OF BOND AND STOCKHOLDERS is the subject of a very interesting letter to the *Commercial and Financial Chronicle* by Mr. John M. Douglas, of London, whose letter to the London *Times* on the defects of American legislation on this subject attracted a great deal of attention in this country at the time. We are not able now to make any detailed examination of Mr. Douglas' letter, but we could not let it pass, nor another article which we copy this week from the *Anglo-American Times*, of London, without observing that it seems to us that the bondholders' right to foreclosure sale is indispensable in the actual circumstances of American railroads. Indeed, the trouble seems rather to be that so many obstacles are put in the way of their taking reasonably prompt possession of the road which fails to pay them their dues. The fact that the British system works well in Great Britain is scarcely any argument in favor of its adoption here. The limitation of the funded debt there, the impossibility of incurring vast floating debts, the frequent reports, the ease with which combinations of shareholders may be made, through the publication of the list of shareholders—these are what make the British system safe, and what are desirable everywhere; but if it had been the law here that a railroad must be worked by a receiver until all the interest, past-due as well as accrued, were paid, then a considerable portion of the American railroad system would be worked by the courts for all time, and the only persons who could ever hope to be benefited by the earnings of these roads could never have any direct voice in their management.

THE STANDARD OIL COMPANY has made further progress towards the control of the oil traffic by a recent contract which unites all the Baltimore refineries, or all but one, in an organization which the Standard Company will control. Nine refining firms or companies, it is said, have consolidated under the name of the "Baltimore United Oil Company," a large part of the stock of which is taken by the Standard Company, while it, or it and others interested in it, will hold a controlling interest one of the parties so interested is said to be the Baltimore & Ohio Railroad. Under the recent contract with the trunk lines, Baltimore will get a certain fixed proportion of the petroleum shipped to the seaboard, so that any efforts of Baltimore refineries to increase their business would be idle, so far as competing with refineries at other cities is concerned.

CUTTING RATES ON EAST-BOUND FREIGHT is charged against a Western road—a road which was a party to the agreement made at the Windsor Hotel last October, which formally requested the trunk lines to refuse to pro-rate with any line so cutting rates, and also to charge its full local rates on all through shipments received from such a road. There was a meeting of railroad managers in New York last Wednesday in regard to this matter, and it is likely that the trunk lines will be called upon to enforce the penalty should the offense be proved and persisted in. As we write, however, the meeting has not been concluded, and we have no idea of its probable action. Meanwhile, the Western roads seem very well satisfied with the division of west-bound traffic out of New York by the trunk lines, though it is only on a small part of this traffic that these Western roads have agreed to the division that is actually made.

THE LIVE STOCK TRAFFIC was the subject of a conference held in Cleveland last week. It is said that the rebate paid to the "eveners," amounting to fifteen dollars per car-load, has heretofore been paid wholly by the trunk lines on shipments made from St. Louis, while it was pro-rated on shipments made from Chicago. It was thus greatly to the advantage of the trunk lines to have the shipments made from Chicago. The result of the conference, it is said, was an agreement to pro-rate from St. Louis and Chicago alike.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Anderson, Lebanon & St. Louis.—Mr. James A. Larnard has been appointed Receiver, on application of a creditor.

Baltimore & Ohio.—At a meeting held in Baltimore, Dec. 12, the board elected John W. Garrett President for the ensuing year, which will be his twentieth consecutive year in that position.

Baltimore & Ohio.—Mr. Charles H. Hudson is appointed Superintendent of the Chicago Division, with headquarters in Chicago. Mr. Walter C. Quincy remains in charge as Superintendent of the Central Ohio, Lake Erie and Straitsville divisions.

Mr. Hudson was recently Division Superintendent on the Chicago, Burlington & Quincy, with which road he has been connected for a long time.

Buffalo & Southwestern.—The board has elected James Adams, President; Henry Martin, Vice-President; Abram Altman, Treasurer; John F. Moulton, General Manager.

Boston & Maine.—At the annual meeting in Lawrence, Mass., Dec. 12, the old board was re-elected, as follows: Nathaniel J. Bradlee, George C. Lord, John F. Osgood, Boston; Nathaniel G. White, Lawrence, Mass.; James R. Nichols, Haverhill, Mass.; Wm. S. Stevens, Dover, N. H.; Amos Paul, South Newmarket, N. H.; Nathaniel W. Farnwell, Lewiston, Me.; Samuel E. Spring, Portland, Me.

Cincinnati & Jeffersonville.—The first board of directors is as follows: Jonas G. Howard, Jeffersonville, Ind.; W. T. Friedly, John R. Cravens, Madison, Ind.; N. P. Schenck, Vevay, Ind.; Simon Byrne, Florence, Ind.; Martin R. Greene, Patriot, Ind.; A. C. Downey, H. S. Espey, H. T. Williams, Rising Sun, Ind.; John Byrne, Samuel F. Covington, Joseph H. Rhodes, Alexander Swift, Cincinnati.

Cleveland, Columbus, Cincinnati & Indianapolis Mutual Insurance Association.—At the annual meeting in Galion, O., Dec. 12, the following officers were chosen: President, Robert Blee; Vice-Presidents C. C. Gale, C. C. Potter; General Secretary, George W. Burt; Treasurer, S. B. Jackson; Auditor, D. M. Eason; Executive Committee, H. M. Townsend, J. Moore, Wm. Cleara, Wm. Thomburg, John Brunton, B. F. Krohn, A. B. Quigley, John Lane.

Connecticut Western.—Mr. Walter Pearce has been appointed General Ticket Agent. He was formerly on the Missouri River, Fort Scott & Gulf, and more lately on the Connecticut Valley road.

Dakota Southern.—It is stated that General Superintendent George E. Merchant has been appointed Treasurer also.

Dorchester & Delaware.—At the annual meeting recently the following directors were chosen: T. W. Anderson, John W. Brown, W. W. Byrn, Charles W. Jefferson, Jonah Helsby, E. W. Le Compte, Lewis Ross, John Webster, John N. Wright. The board re-elected W. Wilson Byrn President; T. W. Anderson, Treasurer.

Eastern.—At the annual meeting in Boston, Dec. 12, the following directors were chosen: By the stockholders, George Ripley, Boston; George W. Gill, Worcester, Mass.; James W. Johnson, Enfield, N. H. By the bondholders, A. P. Rockwell, G. P. King, Charles H. Dalton, John Cummings, Boston; George E. B. Jackson, Portland, Me.; G. S. Morrison, New York.

East & West Texas.—At the annual meeting in Houston, Tex., Dec. 5, the following directors were chosen: Paul Bremond, A. J. Dozier, A. Groesbeck, J. W. Stewart, Samuel C. Timpson. The board elected Paul Bremond President; S. C. Timpson, Secretary; A. J. Dozier, Treasurer.

International & Great Northern.—The office of Purchasing Agent has been abolished; its duties will be performed by the General Superintendent hereafter.

The following appointments of Resident Engineers took effect Dec. 1: J. Herrin, Houston and Red River divisions; F. Harris, Brazos Division; Orville Grove, Northern Division.

Lafayette, Muncie & Bloomington.—Mr. D. S. Hill has been appointed Trainmaster. He has been for some time a conductor on the Cincinnati, Lafayette & Chicago.

Little Rock & Fort Smith.—The following circular is dated Nov. 29: The duties of General Ticket Agent heretofore devolving upon J. W. Gay, General Freight and Ticket Agent, will, on the 1st of December, be assumed by P. J. Bennett, who will take charge of that department, and to whom all reports will be made. Drafts for ticket balances will be drawn by J. W. Gay, Cashier, to whom remittances for balances should be made."

Logansport, Crawfordsville & Southwestern.—Mr. S. H. Long is appointed General Freight and Passenger Agent, in place of J. E. Harris, resigned.

Missouri Pacific.—Mr. E. R. Stiles has been appointed General Roadmaster. He was formerly on the Indianapolis & St. Louis, and at one time President of the Litchfield Car Works.

New York, Providence & Boston.—At the annual meeting in Providence, Dec. 12, the following directors were chosen: Charles H. Salisbury, Providence, Henry Howard, Coventry, R. I.; Nathan F. Dixon, Westerly, R. I.; A. S. Matthews, Stonington, Conn.; John A. Burnham, Boston; Samuel D. Babcock, D. S. Babcock, Wm. F. Carey, Jr., J. Boorman Johnston, George F. Miller, Henry Morgan, New York. There is no change from last year.

Plymouth.—At the annual meeting in Philadelphia, Dec. 10, the following were chosen: President, Coffin Colket; Managers, James Boyd, Daniel Longaker, Wm. H. Slingluff, Edwin Swift, W. T. Wilson, I. V. Williamson; Secretary and Treasurer, Alexander E. Dougherty. The road is leased to the Philadelphia & Reading.

Rhode Island & Massachusetts.—At the annual meeting, Dec. 12, the following directors were chosen: Harvey Chace, Jonathan Chace, Arnold B. Chace, George F. Wilson, E. J. Nightingale, Henry B. Metcalf, Stafford W. Razee, George L. Littlefield, Jesse Boynton. The road is leased to the New York & New England.

Richmond & Danville.—At the annual meeting in Richmond, Va., Dec. 12, Col. A. S. Buford was re-elected President, with the following directors: W. T. Sutherlin, W. L. Owen, Strickland Kneass, Isaac Davenport, Jr., A. Y. Stokes, John Bardsley, A. J. Cassatt, J. N. DuBarry. The stockholders also choose the following as an Examining Committee: W. B. Isaacs, Thomas D. Neal, John P. Branch, B. F. Garrett, W. T. Scott.

Rocky River.—At the annual meeting in Cleveland, O., Dec 11, the following directors were chosen: Elias Sims, Mat. Han

na, J. M. Coffinberry, Josiah Barber, Hiram Barret, George F. Marshall, Henry Lawer.

Sheboygan & Fond du Lac.—Mr. James G. Smith has been appointed General Freight Agent, in place of T. H. Malone, resigned. The appointment took effect Dec. 17.

Standard Oil Company.—Mr. John Archibald, of Titusville, Pa., is President of this company, and Mr. J. N. Camden, of Parkersburg, West Va., is President of the new *Baltimore United Oil Company*, which seems to be a sort of Baltimore branch of the Standard Company.

Utica, Chenango & Susquehanna Valley.—At the annual meeting in Utica, N. Y., Dec. 11, the following directors were chosen: Samuel Sloan, John Brisbin, Wm. E. Dodge, Moses Taylor, Lewis Lawrence, Miles C. Comstock, W. G. Oakman, Hiram Hurlburt, Percy R. Pyne, Eli Avery, Geo. W. Chadwick, Daniel B. Goodwin, Devillo White. The directors then chose the following officers: President, Samuel Sloan; Vice-President, Lewis Lawrence; Treasurer, F. H. Gibbens; Secretary, F. C. Chambers; Executive Committee, Moses Taylor, Wm. E. Dodge, John Brisbin, Lewis Lawrence and Daniel B. Goodwin. The road is leased to the Delaware, Lackawanna & Western.

PERSONAL.

—Mr. T. H. Malone has resigned his position as General Freight Agent of the Sheboygan & Fond du Lac Railroad.

—Mr. John L. Day has resigned his position as General Superintendent of the Louisville, New Albany & Chicago road, his resignation taking effect Jan. 1.

—Mr. Reuben Stewart, Superintendent of the Cheshire Railroad, was last week chosen Mayor of the city of Keene, N. H.

—It is reported that Mr. Lewis Viele, for 15 years past General Freight Agent of the Chicago, Rock Island & Pacific, will shortly resign and go into commercial business.

—M. E. L. Du Barry has resigned his position asGeneral Superintendent of the Chicago & Eastern Illinois Railroad.

—Col. M. G. Harman, of Staunton, Va., died suddenly of apoplexy Dec. 17, while on his way to Richmond in a Chesapeake & Ohio train. Col. Harman held large contracts on the Chesapeake & Ohio, the Valley road and other lines, and owned a number of stages running on Virginia routes. He was 55 years old.

—Mr. Isaac Van Wagenen, formerly for many years Treasurer of the Morris & Essex Railroad Company, died at his residence in Newark, N. J., Dec. 17, in the 79th year of his age. He retired from his position when the road was leased to the Delaware, Lackawanna & Western, and has not since engaged in any business. He was a member of the New Jersey Legislature for several years, and was Speaker of the Assembly in 1845.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Year ending Sept. 30:				
Hartford, Providence & Fishkill	897,644	950,744	Dec.. 53,100	5.6
Expenses	681,706	784,150	Dec.. 102,444	13.1
Net earnings	$215,938	$166,594	Inc .. $49,344	29.6
Earnings per mile..	7,335	7,769	Dec.. 434	5.6
Per cent. of exps...	75.95	82.48	Dec.. 6.53	7.9
New York, Providence & Boston	$853,697			
Expenses	494,690			
Net earnings	$358,998			
Earnings per mile..	13,659			
Per cent. of exps...	57.93			
North Carolina	499,959	$492,339	Inc .. $7,620	1.5
Earnings per mile..	2,242	2,208	Inc .. 34	1.5
Northeast'n, of South Carolina	320,071	382,279	Dec.. 62,208	16.3
Expenses	192,038	220,435	Dec.. 28,397	12.9
Net earnings	$128,033	$161,844	Dec.. $33,811	20.9
Earnings per mile..	3,138	3,748	Dec.. 610	16.3
Per cent. of exps...	60.00	57.66	Inc .. 2.34	4.1
Richmond & Danville	909,317	937,198	Dec.. 27,881	3.0
Expenses	502,839	498,966	Inc .. 3,873	0.8
Net earnings	$406,478	$438,232	Dec.. $31,754	7.2
Earnings per mile..	4,600	4,741	Dec.. 141	3.0
Per cent of expenses	55.32	53.24	Inc .. 2.08	3.9
Eleven months ending Nov. 30:	1877.	1876.		
Cleve., Mt. Vernon & Delaware	$354,869	$345,874	Inc .. $8,995	2.6
Illinois Central, Ill. lines	4,661,525	$4,994,790	Dec.. $333,265	6.7
Ind., Bloomington & Western	1,114,545	1,349,148	Dec.. 234,603	17.4
Midland, of Canada	249,652	259,400	Dec.. 9,748	3 4
Paducah & Memphis..	170 151	190,369	Dec.. 20,218	10.6
St. Louis & Southeastern	1,009,417	998,751	Inc .. 10,666	1.1
Ten months ending Oct. 31:				
Chicago & Alton	$3,755,927	$4,218,278	Dec.. $462,351	11.0
Net earnings	1,664,140			
Per cent. of exps...	55.69			
Chicago, Burlington & Quincy	10,184,936	10,151,013	Inc .. 33,923	0.3
Net earnings	4,738,956	4,955,002	Dec.. 216,046	4 4
Per cent. of exps...	53.47	51.19	Inc .. 2.28	4.4
Cleveland, Mt. Vernon & Delaware	318,861	315,845	Inc .. 3,016	1.0
Net earnings	71,605	63,354	Inc .. 8,251	13.0
Per cent. of exps...	77.51	79.90	Dec.. 2.39	3 0
Nashville, Chattanooga & St. Louis	1,427,413	1,411,487	Inc .. 15,926	1.1
Net earnings	567,750	523,064	Inc... 44,686	8.5
Per cent. of exps...	60 24	62.92	Dec.. 2.68	4.3
Paducah & Memphis..	151,720	171,413	Dec 19,693	11.5
Net earnings	47,825	46,066	Inc .. 1,759	3.8
Per cent. of exps...	68.35	73.30	Dec.. 4.95	6.8
St. Louis, Iron Mt. & Southern	3,516,042	3,043,948	Inc .. 472,094	15.5
Net earnings	1,640,232	1,209,253	Inc .. 430,979	35.6
Per cent. of exps...	53.35	60.27	Dec.. 6.92	10.5
St. Louis & Southeastern	913,590	903,178	Inc .. 10,417	1.2
Net earnings	204,462	191,358	Inc .. 13,104	6.8
Per cent. of exps ..	77.75	78.83	Dec.. 1.08	1.4
St. Paul & Sioux City	430,832	478,739	Dec.. 47,907	10.0
Net earnings	144,944	179,271	Dec.. 34,329	19.7
Per cent of exps ..	66.36	62.52	Inc .. 3.84	6.1
Sioux City & St. Paul	259,644	299,227	Dec.. 39,583	13.2
Net earnings	68,459	88,441	Dec.. 19,982	22.6
Per cent. of exps ..	73 53	70.26	Inc .. 3.27	4.7
Southern Minnesota	536,237	509,683	Inc .. 26,554	5.2
Net earnings	220,059	156,508	Inc .. 63,551	40.6
Per cent. of exps ..	59.00	69.25	Dec.. 10.25	14.8
Nine months ending Sept. 30:				
International & Great Northern	$992,124	$859,060	Inc .. $133,064	15.5
Net earnings	178,238	313,993	Dec.. 135,755	43.2
Per cent. of exps ..	82.04	63.45	Inc .. 18.59	29.3
Union Pacific	9,103,170	9,293,876	Dec.. 190,706	2.1
Net earnings	5,222,381			
Per cent. of exps ..	42.63			
Month of November:				
Cleve., Mt. Vernon & Delaware	$36,008	$30,029	Inc .. $5,979	19.9
Illinois Central, Ill. lines	452,048	429,614	Inc .. 22,434	5.2
Ind., Bloomington & Western	80,815	93,646	Dec.. 12,831	13.7
Paducah & Memphis.	18,431	18,956	Dec.. 525	2.8
St. Louis & Southeastern	95,827	95,578	Inc .. 249	0.3
First week in December:				
Atchison, Topeka & Santa Fe	$57,821	$57,891	Dec.. $70	0.1
St. Louis, Iron Mt. & Southern	129,100	128,987	Inc .. 113	0.1
Week ending Dec. 8:				
Grand Trunk	$200,419	$163,977	Inc .. $36,442	22.2

Grain Movement.

For the week ending Dec. 8 receipts and shipments of grain of all kinds were, in bushels:

	1877.	1876.	Inc. or Dec.	P. c.
Lake ports' receipts	2,096,702	2,668,871	Dec. 572,169	21.7
" " shipments.	1,131,260	1,424,702	" 293,442	20.6
Atlantic ports' receipts	3,383,165	2,792,419	Inc. 490,746	17.5

Of the lake ports' shipments 79½ per cent. were by rail this year, against 97 last, and 100 per cent. in 1875 and 1874. The lake ports' receipts are the smallest for five years, because of bad roads, it is said.

Of the receipts at the Atlantic ports 46.6 per cent. was at New York, 19.9 at Baltimore, 12.1 at Philadelphia, 11.5 at New Orleans, 6.8 at Boston, 2.6 at Portland, and 0.5 at Montreal.

The corn receipts of New Orleans for the week reported have been exceeded but two weeks this year, and Baltimore's have not been so great since June. New York's, on the other hand, have not been so small since navigation opened but twice. The total corn receipts meanwhile were about the average of the past two months. The total grain receipts were the smallest since July, and 40 per cent. less than the average of the previous ten weeks. New York received little more than one-third as much as during the previous week, but New Orleans has not received so much before since May, and has received more but two weeks of this year; Baltimore has received as much but twice since August. The effect of the close of navigation is seen in these changes.

Petroleum Exports.

For the eleven months from Jan. 1 to Dec. 1 the exports of the various ports have been, in gallons:

	1877.	1876.	1875.	1874.
New York	238,578,148	129,978,133	136,931,142	140,712,275
Philadelphia	45,633,085	60,554,674	61,040,468	68,872,129
Baltimore	42,734.977	35,671,774	24,244,923	6,412,006
Boston	4,054,638	3,684,978	2,447,097	3,461,088
Richmond	4,881,289			
Portland	1,405,449			
Norfolk	391,100			
Totals	335,678 686	229,889,559	224,663,630	219,457,498

The exports during the four weeks ending Dec. 1 have been:

	1877.	P. c. of total.	1876.	P. c of total.
New York	18,538,672	67.2	9,621,375	49.6
Philadelphia	3,902,929	14.2	5,398,558	27.9
Baltimore	4,722,104	17.2	3,122,353	16.1
Boston	385,633	1.4	1,238,179	6.4
Totals	27,549,338	100 0	19,380.465	100.0

New York's proportion for eleven months this year has been 71 per cent.; Philadelphia's 13 and Baltimore's 12¾ per cent. Thus the two latter cities have improved their position as exporters.

Report says that the agreement with the Standard Oil Company will give New York 63 per cent. of the sea-board receipts, and the rest to Baltimore and Philadelphia; but this does not determine the proportions to be exported.

Chicago Lumber Traffic.

The receipts and shipments at Chicago from Jan. 1 to Nov. 27 have been, in feet:

	1877.	1876.	Increase.	P. c.
Lumber:				
Receipts	1,033,792,229	1,006,344,685	27,447,544	2.7
Shipments	561,281,844	523,862,360	37,419,484	7.1
Shingles:			Decrease.	
Receipts	489,325,000	527,328,000	38,003,000	7.2
Shipments	163,588,535	207,507,650	43,919,115	21.2

The business is considered to have been, on the whole, quite satisfactory.

Apple Shipments.

Apples form an important item of traffic in some sections of Western New York. During the past fall 83,782 barrels of apples were shipped over the Buffalo & Jamestown road. The largest number shipped from any one station was at Hamburg, and amounted to 17,215 barrels. Pine Valley stands next, 11,991 barrels; Cherry Creek, 8,666; Markhams, 8,347; Gowanda, 6,584; Dayton, 2,709; Conewango, 2,082; Jamestown, 1,958.

Petroleum Movement.

The shipments from the oil regions in November last were 1,269,734 bbls. of 42 gallons, being a daily average of 42,324 bbls.

Coal Movement.

Coal tonnages for the week ending Dec. 8 were:

	1877.	1876.	Increase.	P. c.
Anthracite	471,470	416,144	55,326	13.3
Semi-bituminous	64,910	62,562	2,348	3.8
Bituminous, Pennsylvania	53,920	50,022	3,898	7.8

Cumberland shipments for the week were quite large, the damage done by freshets to the railroad outlets having been repaired. The canal, however, is not likely to be open for business again before next Spring. The Clearfield business continues very good, showing a steady increase over last year.

The Philadelphia & Reading announced on Dec. 17 an increase of 50 cents per ton in the price of coal delivered on board at Port Richmond; also an increase of 25 cents per ton in tolls on all coal passing over the line of the road.

The coal tonnage of the Pennsylvania & New York Railroad for the fiscal year ending Nov. 30 was:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Anthracite	911,755	804,345	Inc.. 107,410	13.2
Bituminous	340,501	361,608	Dec.. 21,107	6.0
Total	1,252,256	1,165,953	Inc.. 86,303	7.4

Of the anthracite coal passing over the road 44,935 tons originated on its line and 866,820 tons came from other roads.

The Joplin Railroad is now carrying 40 carloads per day from the carbon coal field in Kansas and Missouri. A commencement has been made in manufacturing coke from this coal, for use in the lead smelting furnaces at Joplin, Mo.

Coal shipments from Pictou, N. S., for the eleven months ending Dec. 1 were 178,223 tons.

At the meeting of representatives of the anthracite companies in New York, Dec. 13, Mr. Gowen's plan of combination was presented and discussed. No action was taken, the plan being referred to a committee to report at an adjourned meeting Dec. 18. It is reported that the Lehigh Valley hesitated about entering the meeting.

An adjourned meeting was held Dec. 18, the official report of which is as follows:

At a meeting of the anthracite coal trade, held at the Delaware & Hudson Canal Company's office, all interests being represented, the committee reported a plan for the management of the trade, embracing:

First—The establishment of a board of control, with one representative of each interest.

Second—An equitable distribution of the entire production among all interests.

Third—Giving each interest the right to manage its own sales and make its own prices, but establishing a joint coal exchange for the sale of coal.

Fourth—Establishing a penalty of $1.25 per ton for overshipment of quotas, and providing a fund, out of which such penalties shall be payable, of 15 cents per ton on all coal mined.

The above plan was agreed upon and adopted, and a committee—Messrs. Dickson, Linderman, Clark, Hoyt and Gowen—appointed for the purpose of determining to which companies the coal shipped over more than one line should be charged, and of reporting to an adjourned meeting, to be held on the 27th, the several quotas of the respective interests.

Buffalo Lake Commerce.

The number of lake vessels arriving at Buffalo for the season of 1877 was 3,422, and the number cleared 3,426. The total number of vessels arriving at and clearing from the port for the season for a number of years was as follows:

	No. vessels.	Tonnage.	Crew.
1877	6,848	3,543,363	73,901
1876	4,624	2,757,986	55,459
1875	6,278	3,259,830	71,392
1874	7,447	3,641,019	82,862
1873	9,959	4,886,733	107,785
1872	10,308	4,678,058	106,291
1871	16,804	4,832,641	115,299
1870	10,625	4,157,793	105,798
1869	10,201	4,007,196	103,673
1868	11,822	4,254,339	116,329
1867	12,826	5,806,960	129,310
1866	13,682	6,954,959	144,622
1865	13,746	7,032,593	145,074
1864	14,105	6,891,348	148,161
1863	15,376	6,757,903	157,416
1862	16,390	6,689,191	166,133
1861	13,886	5,968,896	144,173
1860	11,517	4,710,175	120,497
1859	10,521	5,952,626	118,119
1858	8 838	3,329,246	86,887
1857	7,581	3,226,806	132,183
1856	8,128	3,018,580	112,051
1855	9,311	3,360,233	111,575
1854	8,942	3,990,764	120,838
1853	8,298	3,252,978	128,112
1852	9,441	3,092,247	127,491

Commenting on these figures for this season, the Buffalo *Commercial Advertiser* says: "Had the activity in lumber, ore, etc., been as great as that in grain, the figures would have been much larger and the effect would also have been seen in higher freights. But, as a whole, the showing is a moderately good one.

"The following shows the average season lake-rate on wheat from Chicago to Buffalo, and the highest freight secured each season, in the years named:

Year.	Ave. season rate.	Highest rate.	Year.	Ave. season rate.	Highest rate.
1861	11.0	26.0	1870	6.2	10.0
1862	10.5	17.0	1871	7.8	18.0
1863	7.5	12.5	1872	11.1	19.0
1864	9.5	18.0	1873	7.8	14.0
1865	9.7	19.0	1874	3.9	6.0
1866	13.4	23.0	1875	3.5	6.5
1867	6.8	15.0	1876	2.9	5.0
1868	7.1	13.5	1877	3.7	6.0
1869	6 6	12.0			

"The average this year, it will be seen, is nearly a cent higher than in 1871, and a trifle better than in 1876; but it is a fraction below that for 1874, and more than two cents below that for 1873. This proves that lake carriers have not laid away a very great amount of money this year, notwithstanding the activity of business. The fact is, the lake fleet is too large for the amount of tonnage now offering, and until the amount increases (which, however, it is likely to do temporarily next year) there will be little permanent improvement.

"But the time will never again return when rich harvests may be gathered from a 26-cent freight, as in 1861, or even a 19-cent rate, as in 1865. Increased capacity of vessels, the more general use of steam, the introduction of the barge system and the competition of the railways, will keep rates more uniform in the future."

RAILROAD LAW.

Refusing Passage to a Drunken Man.

In a recent case the Indiana Supreme Court holds:

A railroad company is not bound to receive any person as a passenger who is drunk to such a degree as to be disgusting, offensive, disagreeable or annoying; and a person so drunk as to be likely to violate the common proprieties, civilities and decencies of life has no right to passage while in that condition. The comfort and convenience of passengers generally must be protected, their opinions and feelings regarded, and a proper decorum observed. Although in a railroad passenger car neither the highest breeding of the drawing-room nor the fastidious delicacy of the parlor is required, yet the behavior of all persons therein should be becoming the place and the general character of the passengers. Slight intoxication, such as would not be likely to seriously affect the conduct of the person intoxicated, would not be sufficient ground to refuse passage in a public car, although the person's behavior might not be in all respects strictly becoming.

Iowa Railroad Aid Law.

A dispatch, dated Dec. 18, from Davenport, Ia., says: "The Supreme Court has decided in the case appealed from this county that the legislative act allowing cities and towns to vote a tax in aid of railroads or other public corporations is constitutional."

Special Contract for Release from Liability.

In the case of Mynard against the Syracuse Railroad Company, an action was brought to recover the value of a steer shipped upon the defendant's railroad under the following special contract—the steer having been lost in transit through the admitted negligence of defendant's servants: In consideration that said defendants would charge but $68 instead of $140 per car-load, the said plaintiffs agreed to "release and discharge the said company from all claims, demands and liabilities of or connected with any damage or injury to or the loss of said stock, or any portion thereof, from whatsoever cause arising."

The County Court gave a judgment to plaintiff on his claim, holding that the contract could not be held to cover an injury through negligence, which was the cause of the damage in this case. A common carrier could not absolve itself from the obligation to use ordinary care and diligence in protecting the property in its charge.

Appeal being taken to the Supreme Court at General Term, this decision was reversed, the contract being held broad enough to cover all causes of injury, even including admitted negligence, and the court further holding that the company had the right to contract for such exemption.

A further appeal was taken and the Court of Appeals has just given its decision, setting aside that of the Supreme Court and affirming the judgment of the County Court, holding with that court that, in spite of the special contract, the carrier does not divest itself of the obligation to exercise ordinary care, nor of the liability for damages caused by negligence.

THE SCRAP HEAP.

Analyses of Iron Clad Paint.

The following analyses of paint manufactured by the Iron Clad Paint Co., of Cleveland, O., were made by Prof. P. B. Wilson, of Baltimore.

	Brown or purple	Hematite, or light brown.	Rossie, or red.
Sesquioxide of iron..	93.68 per cent.	77.26 per cent.	60.50 per cent
Silica.....	3.20 "	13.84 "	18.08 "
Carbonate of lime....	.....	1.84 "	16.66 "
Alumina.....	3.06 "	7.00 "	5.43 "
Sulphur.....	trace.	.....	.....
Moisture.....	.....	.....	0.29 "
Loss.....	0.06 "	0.06 "	0.04 "
Total.....	100.00	100.00	100.00

The equivalent amount of metallic iron in each specimen was 65.60 per cent in the brown or purple paint; 54.11 per cent. in the hematite or light brown, and 42.23 per cent. in the Rossie or red.

Railroad Manufactures.

The Harrisburg (Pa.) Car Works are building 300 freight cars for the Northern Central road.

The Barney & Smith Manufacturing Co., at Dayton, O., is running its works full time with a full force. Since completing the order for 500 tank cars for the Standard Oil Co., the works have furnished the Cincinnati Southern road with 10 passenger, three baggage, two smoking and postal and one officers' car, 125 box, 100 stock and 25 coal cars; they have also turned out four first-class coaches for the St. Louis, Iron Mountain & Southern, 300 grain cars for the St. Louis, Kansas City & Northern and 50 coal cars for the Illinois & St. Louis. There are now contracts on hand for first-class passenger and a baggage, mail and express car for the Central Branch, Union Pacific; four coaches and two sleepers for the Chicago, Milwaukee and St. Paul; an officers' car for the Columbus & Toledo; 50 box cars for the Milwaukee, Lake Shore & Western, and 30 flats for the North Wisconsin. They are building narrow-gauge passenger and freight cars for the Springfield, Jackson & Pomeroy, the Wheeling & Lake Erie and a road in Illinois, and have inquiries from several other roads.

The Clinton Bridge Co., at Clinton, Ia., has now under way in its shops eight iron and 23 combination bridges.

The Philadelphia & Reading Coal & Iron Co. is to make at once, in its rolling mills at Reading, Pa., 18,000 tons of iron rails for the Madeira & Mamore Railroad in Brazil.

The Knoxville Iron Co., at Knoxville, Tenn., is running its rolling mill full time, and is building a new mill with bar and nail plate rolls.

The Knoxville Car Wheel Co., at Knoxville, Tenn., is turning out 18 wheels per day, about half the full capacity of its foundry. The company uses exclusively iron from the Carter Furnace in East Tennessee, which it owns.

The Rogers Locomotive Works, at Paterson, N. J., last week shipped a locomotive to a railroad in South Carolina.

H. & H. Elliott, manufacturers of crossings, frogs, switches and other railroad work, have recently nearly doubled the size of their works at East St. Louis, Ill. They are now running day and night, with orders for two months ahead. Last month they turned out 125 frogs and 15 crossings.

The rolling mills and forge of the Pennsylvania Manufacturing Co., at Lancaster, Pa., are being put in order to resume work.

The Pittsburgh *Telegraph* of Dec. 15 says: "The Westinghouse Air Brake Co., of this city, yesterday received another large order from Europe, by cablegram, for air brakes. This, of course, is in addition to the orders from Belgium and France, previously reported in these columns. The present order is from the London, Brighton & South Coast Railway Company for 50 sets of engine fixtures and 500 sets of car fixtures, amounting to a trifle over $85,000 in gold."

The Brooks Locomotive Works, at Dunkirk, N. Y., are at work on the order for consolidation engines for the Erie, and are also building some narrow-gauge engines for the Olean, Bradford & Warren road.

The Cleveland, Columbus, Cincinnati & Indianapolis repair shops at Cleveland, O., last week turned out a new passenger engine, and have a switching engine nearly finished.

Simmons & Burpee, of St. John, N. B., recently completed a Howe-truss bridge 645 feet long, in six spans, over the Oromocto River at Burton, N. B.

The Kansas Rolling Mill Co., at Rosedale, Kan., are turning out 100 tons of iron rails and 10 tons of fish-plates per day.

Besides contracts heretofore noted, the Phœnixville Bridge Works of Clark, Reeves & Co. are building two small bridges for the Grand Trunk; one bridge of 100 feet span and several small girder bridges for the Great Western; one bridge 155 feet long for a Cuban road; one span of 96 feet and one of 150 feet for the New London Northern; two spans of 110 feet each for the Missouri Pacific; one span of 170 feet and one of 150 feet for the Wabash road.

The Philadelphia *Times* of Dec. 19 says: "The Baldwin Locomotive Works in this city have just received an order from Russia, through Mr. Parry, a member of the firm now in that country, for forty first-class freight locomotives, to be finished by the end of March next. The value of the forty engines will be over half a million dollars, and their construction will require an additional force of from seven to eight hundred men, besides the eleven hundred who are now employed in the works."

Work on the Welland Canal.

We learn from private sources that work on the new Welland Canal has progressed steadily during the season, and that the channel is rapidly nearing completion. It is said that the engineers in charge have endeavored to make this one of the finest works of internal improvement on the continent. Their efforts have been attended with a large degree of success. The appearance of the canal is remarkably uniform, and the work is of a very substantial character. The locks are all completed, except those on sections one, seven and twelve, and it is anticipated that these will be finished before long. The average time required to build a lock, with the improved appliances, is three months. About fourteen courses of cut stone two feet thick are required to each chamber. This shows that heavy blocks only are used. The coping on the top is four feet across. The approaches to the lock-gates are protected by heavy timber cribs filled in with broken stone. This in turn connects with a slope wall of solid cemented masonry. The masonry about the bridges is protected in the same way. The bridges over the new canal are all practically complete, which is also true of the tunnel on section 12. But much work remains to be done on the old canal, extending from Thorold to Port Colborne. The contracts, however, are nearly all let. The aqueduct over Chippewa Creek, which must be constructed in the winter season, has been awarded to Hart, Murray & Co., of St. Catharines, Ont. This is the most difficult job unfinished. The work must be done during the suspension of navigation, at a time of the year when most danger is to be apprehended from freshets.—*Buffalo Commercial Advertiser.*

Steel Makers' and Bankers' Profits.

An English exchange says of Krupp, the great steel maker of Essen: "Herr Krupp, who used to be considered the richest man in Prussia, has now to take a second violin part to Rothschild in Frankfurt. He used to pay, year after year, 84,600 marks as income tax, topping all other income-tax payers. But business has lately been so indifferent that he has had to come down to 63,000 marks, and this falls below Rothschild, who pays 68,400 marks, or $17,100."

OLD AND NEW ROADS.

Atlantic & North Carolina.

In the suit brought by C. M. Hawkins to foreclose the mortgage on this road the United States Circuit Court has refused to grant the application for the appointment of a receiver. The Court held that no proof had been submitted that the property was wastefully or improperly managed, or that the plaintiff was liable to receive any damage from the continuance of the road in the hands of the company. The suit could progress in the ordinary manner and there was no necessity for the appointment of a receiver.

Boston & Providence.

In an item on the new line between Boston & Providence last week, we stated on the authority of a local guide that the fare between the two cities on this road was $1.45. Superintendent Folsom informs us that the fare never was $1.45; it used to be $1.35, and has now been reduced to $1. The distance is 44 miles.

Brockville & Ottawa.

This company gives notice of application to the Canadian Parliament for an act to legalize and confirm the consolidation with the Canada Central, and to place the company under the direct jurisdiction of the Dominion; also to enable it to regulate and consolidate its stock and debt.

Chicago, Milwaukee & St. Paul.

With regard to the new branch from New Lisbon to Necedah, Wis., the *Northwestern Lumberman* says:

"Necedah is the chief manufacturing point on Yellow River, its saw mills having a capacity for producing between 40,000,000 and 50,000,000 feet of lumber per season, though the usual amount marketed ranges from 20,000,000 to 30,000,000 feet. Messrs. Bradford, McCoy & Co., who have hitherto sold the product of their mill through a yard at Quincy, Ill., are closing out their interest at the latter place and will hereafter supply their customers direct from the mill at Necedah, by means of the new rail facilities. This method of transportation has been greatly needed by the Yellow River men for some time and the lack of it has been quite a serious detriment to their operations. The river and its tributaries penetrates a considerable amount of good pine."

Chicago, Pekin & Southwestern.

The suit in which Mr. F. E. Hinckley was appointed Receiver last June was begun by the United States Rolling Stock Company in the Illinois Circuit Court. Recently the plaintiff made application to the Court for the removal of Mr. Hinckley and the appointment of another receiver, but the application was not heard. The plaintiff thereupon took the necessary steps to have the case removed to the United States Circuit Court, which has been done.

In the United States Court also the Farmers' Loan & Trust Company, as trustee, has begun suit to foreclose the first mortgage upon the road. The Court will be asked to appoint a new receiver as soon as possible.

Chicago & Alton.

It is said that several conferences have been held between officers of this company and the St. Louis, Kansas City & Northern, with a view to making a permanent arrangement for Kansas City business over the latter road between Mexico, Mo., and Kansas City. If such an arrangement can be made, it will probably prevent the building of the Chicago & Alton's proposed new line to Kansas City.

Chicago & Eastern Illinois.

Hassler's *Circular* of Dec. 15 says: "Chicago, Danville & Vincennes bondholders who united in the reorganization have been called upon for a cash assessment. Those owning bonds secured on what was known as the Illinois Division are asked for $150 per bond, and those owning Indiana Division bonds are called upon for $50 on each bond."

The National Trust Company, of New York, which was last week put in the hands of a receiver, was a large holder of the bonds, and took an active share in the reorganization.

Cincinnati & Portsmouth.

John W. Rutherford & Co., contractors, have filed a lien against this road for a balance of $67,087, which they claim to be due them. The officers of the company say that payment has been refused because the work has not been done in accordance with the contract.

Cincinnati, Hamilton & Dayton.

A meeting of Cincinnati, Hamilton & Indianapolis bondholders was held last week, at which the proposition of the Cincinnati, Hamilton & Dayton to surrender all the bonds held by it, provided the other holders would exchange one-half of theirs for stock, was rejected. A proposition made by a bondholder, that they exchange one-third of their bonds for stock, was passed by a small majority. No final action was taken, however. It is said that some large bondholders are willing to accept the company's proposition.

Cincinnati, Sandusky & Cleveland.

It will be remembered that at the time of the Lea-Sloane receivership several indictments were found against President Farlow, who is now Receiver, and a number were also found against James D. Lea, who was Receiver at the time. Both sets of indictments have now been quashed, and no further proceedings will be taken under them.

Cleveland, Columbus, Cincinnati & Indianapolis.

This company will build this winter at its docks in Cleveland, O., extensive steam hoisting apparatus for the transfer of coal from cars to lake vessels. This will be in addition to the shutes now in use on the docks.

Cleveland, Columbus, Cincinnati & Indianapolis Mutual Insurance Association.

The annual meeting of this association was held in Galion, O., Dec. 12. The report showed that 97 new members were admitted and 32 reinstated during the year; 18 died and 221 forfeited, leaving 1,412 members at the close of the year. During the year there were 18 assessments for death and one for disability, the total amount paid on claims being $26,894.25; total amount paid since the organization of the association, $117,946.90. The by-laws were amended to change the limit of age for new members from 40 to 45 years, and some minor changes were also made. Resolutions of respect to the memory of the late Wm. L. Needham, Secretary of the Association, were presented and passed.

Cincinnati & Jeffersonville.

This new company purposes building a railroad from Cincinnati southwest to Jeffersonville, Ind., following nearly the line of the Ohio River. Committees have already been appointed to secure subscriptions along the line. The distance is about 110 miles.

Columbus & Coal Valley Extension.

This company, organized a short time ago to build a line from Columbus, O., southeast to McConnellsville, has been consolidated with the Columbus & Northwestern, another new company, which purposes building from Columbus to Fort Wayne, Ind.

Delaware, Lackawanna & Western.

The report, noted last week, that this company had issued an order requiring all its locomotive engineers to leave the Brotherhood is denied. No such order has been issued.

There is, however, on the Syracuse and Utica divisions and to some extent on the main line a movement among some of the men to leave the Brotherhood, and quite a number of the men are said to have joined in it. It is reported, with how much truth it is impossible to ascertain, that this movement has the support of the officers of the road. Nothing has been done in an official way, however, and no order has been issued on the subject.

Dividends.

Dividends have been declared as follows:

Fitchburg, 3½ per cent., payable Jan. 1. Transfer books closed Dec. 17.

Providence & Worcester, 2 per cent., semi-annual, payable Jan. 1.

Lowell & Andover (leased to Boston & Maine), 3½ per cent., semi-annual, payable Jan. 1.

Chicago, Rock Island & Pacific, 2 per cent., quarterly, payable Feb. 1, 1878. Transfer books closed Dec. 19.

Central, of Georgia, 2½ per cent., payable Jan. 2. This is the first dividend since June, 1874.

United New Jersey, 2½ per cent., quarterly, payable Jan. 10.

Philadelphia, Wilmington & Baltimore, 4 per cent., semi-annual, payable Jan. 2.

Southwestern, of Georgia (leased to Central, of Georgia), 3½ per cent., semi-annual, payable Dec. 20.

Detroit & Milwaukee.

Receiver Trowbridge's report for the month of November is as follows:

Balance, Nov. 1	$48,716 70
Receipts on all accounts	91,163 75
Total	$139,880 45
Pay-rolls and other expenses	$65,830 54
Receiver's notes paid	25,000 00
	90,830 54
Balance Dec. 1	$49,049 91

The receipts exceeded the expenditures by $333.21 for the month.

East Tennessee, Virginia & Georgia.

The Knoxville (Tenn.) *Whig and Chronicle* says: "The management of the East Tennessee, Virginia & Georgia and Memphis & Charleston roads contemplate, at an early day, running a fast mail train from Bristol to Memphis, daily, and to consist only of an engine and mail car, to go at the rate of 33½ miles per hour. This will be necessitated on account of the heavy through mails for Alabama, Mississippi and Texas, which are now passing over this line. It is constantly on the increase, and the postal clerks on the trains are worked pretty close to get through with them."

Eastern.

Holders of Portsmouth, Great Falls & Conway bonds have begun a suit in New Hampshire to compel the payment of interest upon the bonds in accordance with the terms of the lease. The complaint sets forth that there are $1,000,000 of these bonds, of which $514,000 have been sold and $486,000 are held by the Eastern Company. The Court is asked to enjoin the Eastern Company from selling any of the bonds which it holds; to make an order requiring it to pay interest on the bonds sold, and to appoint a receiver for the revenue of the Conway road.

Fairfield & Western.

A company has been organized to build a railroad from Fairfield, Texas, east by south to Oakwood on the International & Great Northern road, a distance of 22 miles. A considerable amount has already been subscribed.

Flint & Pere Marquette.

The Detroit *Post and Tribune* says: "The Flint & Pere Marquette Railway having established a line of steamers across Lake Michigan, and built a grain elevator at Ludington, is shipping grain to Europe via its road and the Grand Trunk. A cargo of flour and pork for Liverpool has just gone forward."

Galveston, Houston & Henderson.

There is now almost an open war between this company and the Houston & Texas Central. The latter company has apparently been dissatisfied for some time with the control of the Galveston road by the International & Great Northern, and is doing everything in its power to divert business from it. The Central trains are run so as to make connections with the Galveston road as difficult as possible, and freight is sent to Galveston by Morgan's road to Clinton and thence by steamer.

Gulf, Colorado & Santa Fe.

In order not to embarrass the prospects of this road and to simplify as much as possible the litigation recently begun, all the new board of directors have tendered their resignations. What further action will be taken is as yet undecided, and depends chiefly upon the Galveston County Court.

A proposition has been received from a contractor, who offers to extend the road to Belton in one year for $10,000 per mile in money, or $15,000 per mile in bonds of the company.

Intercolonial.

The agitation in favor of Halifax as the "winter port of Canada" has been renewed this season. In order to secure shipments to Europe by way of Halifax the Government has been asked for a considerable reduction of through rates over this road, and it is expected that rates will be made which will enable grain to be shipped from Montreal to Liverpool by way of Halifax at the same rates as by way of Portland. The distance from Halifax to Montreal by the Intercolonial is 848 miles, of which 561 miles belong to the Intercolonial. The distance from Portland to Montreal is 297 miles.

Illinois Central.

The Land Department reports for November sales of 794.74 acres of land for $5,895.23. Cash collections on land contracts were $9,199.50.

The Traffic Department reports the earnings of the 707 miles in Illinois as follows: 1877, $452,048; 1876, $429,614.28; increase $22,433.72.

James River & Kanawha Canal.

The damage done to this canal by the recent freshets was so great that it will be a very difficult matter for the company to raise money for the repairs. Some sections of the canal will have to be rebuilt. In view of this state of affairs it is suggested that the canal be abandoned altogether as a canal, and its works be used as the road-bed of a railroad. A proposition is already before the Richmond City Council for a city subscription for this purpose. It is said that the necessary changes can be made and the rails laid in about the same time as would be required to put the canal in working order again.

Kansas Central.

The track on this road is now laid to Onaga in Pottawattomie County, Kansas, 80 miles westward from Leavenworth and 12 miles beyond the late terminus at Soldier Creek. The road being completed across Jackson County according to contract, the bonds voted by that county have been delivered to the company.

Midland, of Canada.

A circular from this company gives notice that it is unable to pay the interest on its first-mortgage bonds or the principal of the funded interest bonds which fell due Dec. 1. The com-

pany now asks the consent of bondholders to the issue of $525,000 preferred bonds, to bear 2½ per cent. interest for three years and 5 per cent. thereafter, and offers, if such consent is given, to transfer one-half the stock to the trustees under the first mortgage. The proceeds of the new bonds are to be applied to the completion of the road to Midland City; to the necessary repairs of the old road; to the purchase of sufficient equipment, and the payment of the floating debt.

Meetings.

Meetings will be held as follows:

Central, of Georgia, annual election, at the banking house in Savannah, Jan. 7, at 10 a. m.

Philadelphia & Reading, annual meeting, at Concert Hall, Philadelphia, Jan. 14, at noon.

Boston & Lowell, annual meeting, at the passenger station in Boston, Jan. 2, at 10 a. m.

Mobile & Ohio.

The United State Supreme Court has granted a rehearing on the recent order directing the sale of this road. The arguments in the case will be heard on Jan. 14, and the order of sale is suspended to await the further action of the Court.

Montreal, Portland & Boston.

President Goff reports that there are still 21 miles of this road to build, and that about three-fourths of this section are graded. He hopes to have the road completed next season. He denies a report that the Grand Trunk had tried to prevent the completion of the road, or had thrown obstacles in its way.

New York Central & Hudson River.

Orders have been issued to conductors to punch all through tickets once after leaving each of the following stations: New York, Peekskill, Poughkeepsie, Hudson, Albany, Troy, Schenectady, Amsterdam, Palatine Bridge, Little Falls, Utica, Rome, Canastota, Syracuse, Port Byron, Clyde, Palmyra, Rochester and Batavia; on the Rochester & Niagara Falls Branch, after leaving Rochester and Medina; on the Auburn Branch, after leaving Syracuse, Auburn, Geneva and Canandaigua. Local tickets on the Niagara Falls Branch will be punched after leaving Rochester, Brockport, Medina and Lockport. Between Buffalo and Suspension Bridge tickets will be punched after leaving Buffalo and Tonawanda. Tickets will be punched twice between Buffalo and Lockport, and between Canandaigua and Batavia, and once only between Batavia and Tonawanda or Attica.

These orders have been issued on account of frequent frauds on the company practiced by persons who travel frequently on the road, and who took advantage of the old regulations to escape payment of fare, or to travel over a longer distance than they had paid for.

New York Elevated.

This company has just let the contracts for the construction of its road on the east side of New York, from South Ferry through Pearl street, the Bowery and Third avenue to Sixty-first street, and also for the second track of it west side line in Greenwich street and Ninth avenue. This latter is expected to be completed by April next. The contracts have been let to some five or six different contractors.

Northern Pacific.

The St. Paul *Pioneer-Press* says: "The Northern Pacific Railroad Company sold land in November to the amount of 65,732 acres for $284,680.40. There were 70 different purchasers. With the exception of a half dozen who bought for the purpose of opening large farms of from 2,000 acres upwards, the remaining sales were in small lots of less than an average of 600 acres each, and to parties buying almost exclusively for settlement and cultivation. The absorption of government lands along the line of this road by actual settlers keeps pace with the railroad land sales, the Fargo, Dakota, U. S. land office reporting for the month of November 25,523 acres taken by 173 different claimants."

Ohio State Canals.

The recent action of the lessees in attempting to surrender the lease of the Ohio canals was caused by the act of the last Legislature authorizing the cutting off of the basin at Hamilton. The lessees claim that this will take away a large part of their business, and will prevent them from making any profit whatever. The Board of Public Works refused to accept the surrender of the lease, believing that they had no authority to do so. In order, however, that the canals may not suffer from the want of the usual repairs, both parties have agreed that a receiver should be appointed. The necessary proceedings have been begun by the Board of Public Works in the form of a suit for the semi-annual installment of rent, and it is understood that the court will appoint two receivers, one to represent the State and one the lessees.

Olean, Bradford & Warren.

Track is now laid from Bradford, Pa., northeast to Tarport, about five miles, and trains are running. Work on the rest of the line towards Olean is being pushed as fast as possible.

Pennsylvania.

The city of Cumberland, Md., has voted to subscribe $65,000 in aid of the proposed extension of the Bedford Division to Cumberland. That division now ends at the Pennsylvania State line, six miles from Cumberland. The extension will be built by a company organized for the purpose, and known as the Pennsylvania Railroad Company in Maryland. The estimated cost of the extension is $150,000, and it is to be met by the city subscription, for which second-mortgage bonds will be issued, and by a first mortgage for $85,000.

Plainview.

G. W. Van Dusen & Co., of Rochester, Minn., have offered to build a railroad of standard gauge from Plainview, Minn., south to the Winona & St. Peter near Eyota, about 14 miles, provided the people along the line will raise $100,000. It is probable that the Plainview people will accept this offer, instead of building a narrow-gauge road east to the Mississippi, as proposed.

Pittsburgh, Cincinnati & St. Louis.

This company has issued the following notice to the holders of its 7 per cent. consolidated mortgage bonds:

"The Pittsburgh, Cincinnati & St. Louis Railway Company believing that many of the holders of this class of their bonds desire to avail themselves of the privilege conferred upon it by the various States through which its railway passes, to convert their present coupon bond into a registered bond, without coupons, having the same security of the mortgage and lien upon the company's property as the present coupon bond, hereby give notice that if a sufficient number of the holders of said bonds, representing in amount not less than $1,000,000, signify their desire to make such conversion, this company will have prepared the registered bonds and registry books necessary to carry the proposed change into effect.

"Bondholders desiring to avail themselves of this privilege should notify the Treasurer of the company on or before the first day of February next."

Quincy, Payson & Southeastern.

The Quincy (Ill.) *Whig* of Dec. 13 says: "President Lyon and General Manager Buell, of the Quincy, Payson & Southeastern Railway, have been in town a few days looking after the interests of their road. Yesterday and to-day they closed a contract for 3,000 tons of rail and the rolling stock for the east division of the Quincy, Payson & Southeastern Railway, to be delivered for cash and at once. They are now ready to close the contract for the levee and railroad from Quincy to Warsaw. Iron and rolling stock are now ready for this division as soon as arrangements can be made with the citizens of Adams and Hancock counties for the work."

Ripley, Wilmington & Dayton.

A company by this name has been organized to build a narrow-gauge road from Ripley, O., on the Ohio River, by way of Georgetown, Buford and Martinsville to Dayton, about 80 miles. The capital stock is to be $200,000.

Richmond & Danville.

At the annual meeting in Richmond, Va., Dec. 12, the following report on the damage done by the recent floods was presented by President Buford: "No bridge or other property was at all injured between the James and Staunton rivers. At the latter, the comparatively new Howe truss bridge, of 600 feet in length, was dislodged and carried down the river for more than a mile, where it drifted out and three spans of it remain much damaged, but not broken up. The fourth span, which was broken off, has lodged 15 miles below, and is reported to be much twisted and the timbers shattered. To what extent it can be utilized in another structure has not yet, for want of opportunity, been carefully ascertained. Doubtless a part of the material can be. Nine loaded box cars placed on the bridge a few hours before for the purpose of holding it in position were carried off in the bridge. They will be recovered with their contents, chiefly cotton in bales, and, on present indications, apparently with little damage.

"In the valley of the river east of the bridge for a distance of about 7,000 feet—1⅓ miles—the track was for the most part displaced, a portion being washed to a remote point. Two girder bridges of a permanent character were carried off, and a considerable portion of the embankment at intervals washed out either partially or entirely.

"I am gratified to be able to state that the crossing was completed on yesterday, and all trains are now in regular movement over the whole line. It is deemed important that this bridge be replaced at the earliest practicable period, in security against any further interruption of company's traffic, and to this the management will doubtless give their immediate attention."

The meeting approved the annual reports as presented. A resolution prohibiting the issue of free passes, except in charity cases, was rejected.

Rhode Island & Massachusetts.

At the annual meeting in Providence last week it was reported that the total amount paid for the road thus far had been $96,087. The amounts yet to be settled are a small balance in dispute with the contractors; 13 claims for land damages still pending before commissioners; the work at the Diamond Hill and Cumberland Mills crossings, and some work done by the New York & New England after the lease of the road. The stock subscriptions yielded $80,090, besides $7,210 in delinquent subscriptions, and the company owes $24,000 in notes falling due March, 1878. The lease to the New York & New England is for ten years, the rental to be $8,800 per year for the first three years, and $10,000 per year for the rest of the term.

Seaboard & Roanoke.

The temporary bridge over the Roanoke at Weldon, N. C., which replaces that carried away by the recent freshet, was completed so that trains passed over Dec. 20. Freight business over the road is now fully resumed.

Southern, of Canada.

Two or three conferences have been held recently between the officers of this company and the Connecticut & Passumpsic Rivers Company, and it is said that, while nothing definite has yet resulted from the meetings, it was at least decided that the differences between the two companies could be arranged amicably. It is expected that another conference will be held soon.

On the other hand it is reported that the Grand Trunk has bought the controlling interest in the road held by the late Col. Foster, and that it will take possession as soon as some minor points are adjusted.

Southern Minnesota.

Notice is given that an interest dividend of $40.51 per bond will be paid on the construction bonds represented by certificates of the Farmers Loan & Trust Company. The dividend will be paid on and after Jan. 2 at the office of the Farmers' Loan & Trust Company in New York, and transfer books will be closed from Dec. 24 to Jan. 2.

St. Louis, Iron Mountain & Southern.

Trouble is reported between this company and the Louisville & Nashville as to rates from St. Louis on Green Line business to Nashville and points beyond. The announcement was made last week that the company would make no through rates on such business, but this was afterwards withdrawn, and the company is now forwarding Green Line freight from St. Louis at the same rates as are charged from Louisville. These rates leave the company an extremely small compensation for the haul from St. Louis to Belmont, and it is said that the Nashville, Chattanooga & St. Louis refuses to bear any part of the reduction.

St. Louis & Southeastern.

The Auditor's statement for October is as follows:

	St. Louis Div.	Kentucky Div	Tenn. Div.	Entire Line.
Gross earnings	$68,846 68	$32,013 90	$14,965 63	$115,826 21
Expenses	37,109 09	30,777 32	9,109 03	76,995 44
Net earnings	$31,737 59	$1,236 58	$5,856 60	$38,830 77
Per cent. of expen's	53.94	96.18	60.73	66.49

As compared with October, 1876, the entire line shows an increase of $950.31, or 0.8 per cent., in gross earnings, and a decrease of $7,048.76, or 15.4 per cent., in net earnings.

Tiffin & Northwestern.

A company by this name has been organized to build a railroad from Tiffin, O., west by north to a point in Williams County, on the Indiana line. The capital stock is to be $1,500,000. The distance is about 90 miles.

Union Railroad, Transfer & Stock Yards.

We have received a map of this company's road, generally known as the Indianapolis Belt road, which shows very clearly the line and connections of the road. It extends from the Cleveland, Columbus, Cincinnati & Indianapolis northeast of the city around its east, south and west sides to the Indianapolis, Cincinnati & Lafayette on the northwest. It forms about two-thirds of a circle and connects all the lines entering the city, except the Indianapolis, Peru & Chicago. The stock-yards are near the Indianapolis & Vincennes track, southwest of the city. The distances on the road are as follows: Indianapolis, Cincinnati & Lafayette to Indianapolis, Bloomington & Western, 2.6 miles, single track; thence to Indianapolis & St. Louis, 0.4 mile, single track; thence to Terre Haute & Indianapolis, 0.1 mile, single track; thence to Indianapolis & Vincennes and the stock-yards, 1.0 mile, double track; thence to Jeffersonville, Madison & Indianapolis, 1.8 miles, double track; thence to Indianapolis, Cincinnati & Lafayette (Cincinnati line), 2.2 miles, double track; thence to Cincinnati, Hamilton & Indianapolis and Pittsburgh, Cincinnati & St. Louis, 1.2 miles, double track; thence to Cleveland, Columbus, Cincinnati & Indianapolis, 2.8 miles, single track. The whole length of the road is 12.1 miles, of which 6.2 miles are double and 5.9 miles single track. From the nature of the road and its business there is an unusual length of sidings.

Western North Carolina.

Work on the Swannanoa tunnel is now progressing well, the heading extending beyond the central shaft and advancing at the rate of three feet per day. It is expected that trains will run through the tunnel by next June and to Asheville before the end of next year.

West River Valley.

There being no present prospect of the construction of the Brattleboro & White Hall road, it is now proposed to build a road from Brattleboro, Vt., up the valley of West River to Jamaica, Londonderry or Weston. It is proposed to build a road of 2 ft. gauge on the plan of the Billerica & Bedford, and subscriptions will be asked from the towns interested.

Wisconsin Central.

A dispatch from Milwaukee, Wis., Dec. 17, says: "Judgment for $300,000 was rendered to-day in the United States Court against the Phillips & Colby Construction Company, now operating the Wisconsin Central Railroad. This afternoon the Construction Company transferred the road to the Wisconsin Central Company, of which Phillips and Colby are officers and managers."

Wheeling & Parkersburg.

It is proposed to build a narrow-gauge road from Wheeling, W. Va., down the east bank of the Ohio to Parkersburg, a distance of about 80 miles. It is claimed that the road can be cheaply built, and that it could command a fair business. For more than half the year, however, it would have to meet the competition of the river boats.

Master Mechanics' Association—Circular of Inquiry.

The undersigned were appointed a committee to investigate the subject "The Best Form and Material for Locomotive Wheels and Axles; also The Best Methods of Counterbalancing."

In order to obtain the necessary information from which to make this report, they would respectfully solicit replies to the following questions:

Section I.—Engine Trucks.

1st. How many engines have you on your road equipped with cast-iron wheels in engine truck?

2d. How many with cast wheel-centres and steel tires?

3d. How many with cast wheels with steel faces?

4th. What other kinds have you in use?

5th. How do these compare for first cost and for cost of maintenance per mile run?

6th. For this purpose, please state what description of wheels you recommend, and whether you prefer spoked, single or double-plated wheels?

Section II.—Driving Wheels.

1st. What kind of wheel centres do you recommend for driving wheels? Hollow spokes, with hollow rim and nave or hub? or solid spokes with solid rim and hub? or solid spokes with hollow rim and hub?

Section III.—Tender Wheels.

1st. How many engines have you that are equipped with cast-iron tender wheels?

2d. How many with cast centres with steel tires?

3d. How many with cast wheels with steel faces?

4th. What other kinds have you in use?

5th. Which gives the best result in miles run, including first cost and cost of maintenance?

6th. For this purpose, what wheels would you recommend? Please state style preferred.

Section IV.—Truck Axles.

1st. What are your standard sizes for journals for engine-truck axles on standard American engines, of 16 inch × 24 inch cylinders? Also, give size of wheel seats.

2d. How many engines have steel and how many have iron axles in engine truck?

3d. Which gives the best results, considering first cost, wear of journals and brasses, and cost of lubricants?

4th. From your experience, what materials would you use, and what dimensions would you give for this purpose?

Section V.—Driving-Wheel Axles.

1st. What are the dimensions of driving-wheel axles for American engines, 16 inch × 24 inch cylinders? Give size of journals, wheel-seat and centre of shaft.

2d. How many engines have you with steel, and how many with iron axles?

3d. Which gives the best results, considering the first cost, wear of journals and brasses, and cost of lubricants?

Section VI.—Tender Axles.

1st. Give the dimensions of your standard tender axles, including size of journal, length of axle, size of wheel-seat, and diameter of axle in centre.

2d. How many engines have iron axles and how many steel axles in tender?

3d. Which gives the best results, considering the first cost, wear of journals and brasses, and cost of lubricants?

4th. Please state which, in your opinion, is the better material for tender axles—steel or iron. Also the best dimensions for this purpose.

Section VII.—Valuable Suggestions, Etc.

1st. Please give any information which may occur to you as being valuable to the committee in the preparation of their report. Also, please, if convenient, send tracing (on small scale) of standard axles for engines and tenders.

Section VIII.—Counterbalancing.

1st. Please state your method of ascertaining the necessary amount of counterbalance, and your manner of applying it.

Replies to the foregoing questions are solicited before March 1, 1878, and should be addressed to "F. M. Wilder, Master Mechanic, Erie Railway, Buffalo, N. Y." Yours respectfully,

F. M. WILDER,
Master Mechanic Erie Railway.
JOHN ORTTON,
Mechanical Engineer Canada Southern Railway.
PETER CLARKE,
Master Mechanic Northern Railroad of Canada.

ANNUAL REPORTS.

Delaware & Hudson Canal Company.

The following statements for this company's leased roads are from the reports made to the New York State Engineer for the year ending Sept. 30, 1877.

ALBANY & SUSQUEHANNA.

This road has a main line from Albany to Binghamton, 142.20 miles, with 34.75 miles of branches, 176.95 miles in all. Its capital account at the close of the year was as follows:

Stock ($19,780 per mile)	$3,500,000 00
Funded debt ($34,162 per mile)	6,045,000 00
Total ($53,942 per mile)	$9,545,000 00
Cost of road, expended by lessor	6,702,637 15
Cost of road, expended by lessee	2,995,138 79
Total ($54,805 per mile)	$9,697,775 94

The funded debt was increased during the year by $103,000. The passengers and freight carried were:

	1876-77.	1875-76.	Decrease.	P. c.
Pass'gers carried.	304,901	346,568	41,667	12.0
Tons freight carried	779,693	944,783	165,090	17.5

The earnings for the year were as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c
Passengers	$283,874 41	$314,566 34	Dec. $30,691 93	9.8
Freight	871,891 47	941,751 41	Dec. 69,859 94	7.4
Other sources	5,360 77	53,603 16	Dec. 48,242 39	90.0
Total	$1,161,126 65	$1,309,920 91	Dec. $148,794 26	11.4
Expenses	713,579 37	897,757 27	Dec. 184,177 90	20.5
Net earnings	$447,547 28	$412,163 64	Inc. $35,383 64	8.6
Gross earn. per mile	6,561 89	7,402 77	Dec. 840 88	11.4
Net earn. per mile	2,259 28	2,329 27	Inc. 199 96	8.6
Per cent of exps.	61.45	68.54	Dec. 7.09	10.3

The result to the lessee was as follows:

Net earnings of road	$447,547 28
Rentals paid	709,164 41
Net loss for the year	$261,617 13

There were seven persons killed and one injured on the road during the year.

NEW YORK & CANADA.

This road has a main line from White Hall to Rouse's Point, 112.42 miles, with 36.54 miles of branches, 148.96 miles in all. It was built and the stock is owned by the lessee. The capital account is as follows:

Stock ($26,853 per mile)	$4,000,000 00
Funded debt ($26,853 per mile)	4,000,000 00
Floating debt	267,594 93
Total ($55,502 per mile)	$8,267,594 93
Cost of road ($55,472 per mile)	8,263,060 79

The floating debt increased by $51,009.20 during the year, stock and funded debt being unchanged. The passengers and freight carried were:

	1876-77.	1875-76.	Decrease.	P. c.
Passengers carried	109,825	113,794	3,969	3.5
Tons freight carried	181,063	181,785	722	0.4

The earnings for the year were:

	1876-77.	1875-76.	Increase.	P. c.
Passengers	$189,995 64	$182,487 92	$7,507 72	4.1
Freight	199,246 48	188,129 64	11,116 84	5.9
Other sources	368 37	343 49	24 88	7.2
Total	$389,610 49	$370,961 05	$18,649 44	5.0
Expenses	272,727 34	259,672 74	13,054 60	5 0
Net earnings	$116,883 15	$111,288 31	$5,594 84	5.0
Gross earn. per mile	2,615 54	2,490 34	125 20	5.0
Net earn. per mile	784 66	747 10	37 56	5.0
Per cent. of expenses.	70.00	70.00	.....	....

The operating expenses are fixed at 70 per cent. by agreement with the lessee. The result to the lessee for the year was:

Net earnings	$116,883 15
Interest paid	247,369 20
Loss for the year	$130,486 05

The loss for the preceding year was $85,782.89.

RENSSELAER & SARATOGA.

This road includes the main line from Albany to White Hall, 79.10 miles, and 102.77 miles of branches, 181.87 miles in all. The principal branches are from Eagle Bridge, N. Y., to Rutland, Vt., 61 miles; from White Hall, N. Y., to Castleton, Vt., 13.14 miles, and from Ballston to Schenectady, 14.97 miles. The capital account is as follows:

Stock ($37,687 per mile)	$6,854,100
Funded debt ($11,052 per mile)	2,000,000
Total ($48,739 per mile)	$8,854,100

The stock was increased $82,100 during the year. The passengers and freight carried were:

	1876-77.	1875-76.	Decrease.	P. c.
Pa-sengers carried	1,120,244	1,272,856	152,610	12.0
Freight carried	554,236	617,117	62,881	10.2

The earnings for the year were as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Passengers	$623,866 26	$685,969 36	Dec. $62,103 10	9.1
Freight	795,263 90	881,855 75	Dec. 86,591 85	9.8
Other sources	32,631 88	58,957 93	Dec. 26,326 05	44.6
Total	$1,451,762 04	$1,626,783 04	Dec. $175,021 00	10.8
Expenses	942,129 57	1,049,186 99	Dec. 107,057 42	10.2
Net earnings	$509,632 47	$577,596 05	Dec. $67,963 58	11.8
Gross earnings per mile	7,982 42	8,944 76	Dec. 962 34	10.8
Net earn. per mile.	2,802 18	3,175 87	Dec. 373 69	11.8
Per cent. of expens.	64.90	64 50	Inc. 0.40	0 6

The net result to the lessee was as follows:

Net earnings	$509,632 47
Rental	763,272 50
Net loss for the year	$253,640 03

The loss for the preceding year was $177,656.45. There were 11 persons killed and three injured during the year.

Great Western, of Canada.

The road worked by this company consists of a main line from Windsor, Ont., to Suspension Bridge, 229.88 miles; the Loop Line, from Glencoe to the International Bridge, 145.5 miles, and 120.92 miles of branches owned, the chief of which are the Toronto Branch, 37 miles, and the Sarnia Branch, 50.85 miles; 14.83 miles of the Welland Railway are leased and used for the purpose of connecting the Loop Line with the Main Line at Suspension Bridge. The total mileage covered by the report is thus 495.80 miles owned and 14.83 miles leased, 510.63 miles in all. The company also leases the Wellington, Grey & Bruce, 168.35 miles; the London, Huron & Bruce, 68.89 miles; the London & Port Stanley, 23.66 miles, and the Galt & Guelph, 15.25 miles, but the earnings of these leased lines, 276.15 miles in all, are not reported. The latest report is for the half year ending July 31, 1877.

Of the capital account the report says: "The charges against capital account during the half-year amount to £33,209. They include the transfer of the adjusted balance of the London, Huron & Bruce capital expenditure, leaving a sum of £2,081 still available for similar outlay on that line, which is entirely the property of this company. The balance available for capital expenditure on the Wellington, Grey & Bruce Railway is £3,610.

"Since the termination of the half-year (viz., on Oct. 1, 1877,) 5½ per cent. bonds to the amount of £485,000 have fallen due, and have been duly paid off, or exchanged for three or five years 7 per cent. bonds, on presentation. With a view to provide in part for paying off or exchanging these bonds, but so that no increased annual charge on account of bond interest might be incurred, the shareholders at a special general meeting held on Aug. 3, 1877, authorized the directors to issue 31,714 additional shares. These shares were allotted at that date to the shareholders, at the rate of 12 for every 100 existing shares, and at the price of £5 5s. per share. The whole issue has been taken up by the shareholders. The particulars of these operations will be shown in the next half-year's accounts."

The earnings and expenses for the half-year were as follows, comparisons being made with the corresponding half of 1876:

	1877.	1876.	Decrease.	P.c.
Gross receipts	£370,514	£394,769	£24,255	6.1
Working expenses, excluding credits to reserve funds	275,716	290,647	14,931	5.1
Net earnings	£94 798	£104,122	£9,324	9.0
Loss on leased lines, interest on bonds, debenture stock, etc.	97,995	101,514	3,519	3.5
Deficit or surplus	Def. £3,197	Net £2,608	.....	...

The working expenses were 74.41 per cent. of earnings in 1877, against 73.63 per cent. in 1876. Reduced to American currency, the gross earnings this year were $3,617 and the net earnings $926 per mile worked.

There was a decrease on all through earnings and also on local passenger business, local freights alone showing a gain. The extremely low rates on through traffic continued during a part of the half year, but a partial increase took effect towards its close. The passenger earnings have diminished steadily for several years.

The earnings and working expenses on a gold basis for the last six half years are as follows:

Half years ended—	Earnings per train mile. s. d.	Cash working expenses, excluding renewal and other funds. Per train mile. s. d.	Per cent. of gross receipts.
Jan. 31, 1875	6 8¼	4 11¾	74.38
July 31, 1875	4 11¾	4 6	90.32
Jan. 31, 1876	5 7	3 11½	70.99
July 31, 1876	4 10¾	3 6¾	73.63
Jan. 31, 1877	4 9	3 8½	78.11
July 31, 1877	4 9½	3 6¾	74.41

The average rate at which conversions of American currency have been effected during the half year is 105.54 as against 113.18 in the corresponding half year.

After long consideration the directors resolved, in view of the deficit on the half year's workings, not to make the usual credits to the renewal funds, but only to make credits for the actual expenditures, amounting to £1,645 for the car renewal fund, and £8,118 for the rail and bridge renewal fund. The suspended credits will be made good out of the income of future half-years. The amounts standing to the credit of these renewal funds July 31, 1877, were £181,889 in all.

Concerning the leased lines the report says:

"Omitting the charge for interest on the London, Huron & Bruce Bonds, and the transfer to renewal funds, the aggregate loss on working leased lines for the past half-year, including the rent of the Welland Railway, amounts to £3,723 as compared with £6,734 for the corresponding half-year. The gross traffic of the Wellington, Grey & Bruce line, in comparison with the corresponding half of 1876, exhibits a decrease of £6,446, mainly due to the deficient wheat harvest of last autumn and to the stagnation of the lumber trade. The cash lost on working this line (after crediting the Wellington, Grey & Bruce Company with 30 per cent. of the gross traffic) has been £6,843 against £7,586 in 1876. The London, Huron & Bruce Railway shows a profit on working (exclusive of bond interest) of £3,304. Under the traffic agreements with the Wellington, Grey & Bruce Company, the sum of £2,747, being 20 per cent. of the earnings derived from additional traffic interchanged with that railway (for the six months to July 31, 1877), will be applied to the acquirement of the Wellington, Grey & Bruce bonds at par. Some additional expenditure for the renewal of bridges on the London & Port Stanley Railway has been found necessary, but it will be spread, through the operation of the leased lines suspense account, over the remaining term of the lease. The increased charge for this half-year is £360."

Arrangements for acquiring the Brantford, Norfolk & Port Burwell road, as authorized by the stockholders, are nearly completed. Unexpected difficulties have arisen in the reorganization of the Detroit & Milwaukee road, and little or no progress has been made.

The President's visit to America and his conferences with the managers of other lines are mentioned as having had satisfactory results. Concerning the negotiations with the Grand Trunk the report says: "After a lengthened negotiation between the Presidents and leading officials of the Grand Trunk and Great Western companies, commenced at Montreal in August last, and continued at Sarnia in September, an agreement was entered into between the two Presidents, which has since been confirmed by the boards of both companies. A copy of this agreement is printed as an appendix to the present report. The Great Western company were willing that the whole of the traffic between points common to the system of both companies, and controlled by them, should be divided, the percentages to be settled by Sir William Richards, Chief Justice of the Supreme Court of the Dominion; and the Great Western were also prepared to divide similarly other branches of traffic more or less controlled by the two companies, but not strictly between common points. The Grand Trunk representatives were, however, unwilling to consent to such a division of traffic, unless it were much more comprehensive, and (except as to local traffic) unless it were made on what is called in America a 'physical' or material basis, as opposed to a division of gross earnings. The Great Western representatives were unable to accept those conditions. The directors hope that the maintenance of the provisions of this agreement by the joint committee of both boards will obviate a recurrence of the contention and competition which in the past have entailed loss on both companies."

The auditors call the attention of stockholders to the absence of the usual credits to the renewal funds, and recommend that some action be taken in the matter.

LOCOMOTIVE RETURNS, AUGUST, 1877.

Master Mechanics of all American railroads are invited to send us their monthly reports for this table.

Name of Road.	Number of miles operated	Number of Locomotives in service	Mileage. Total	Mileage. Average per Engine	No. Miles run to Ton of Coal	No. Miles run to Cord of Wood	No. Miles run to Pint of Oil	Average No. of freight cars hauled	Average cost per freight car per mile, cents.	Cost per Mile in Cents for Repairs	Fuel	Stores	Miscellaneous	Engine'rs, firemen, and wipers	Total	Av. c'st of Coal, per ton or bushel	Av. c'st of Wood per cord
																$	$
Allegheny Valley (River Division)*	139	....	107,370	.....	37.77	.....	17.32	22.10	0.921	6.48	3.50	0.62	....	6 14	16 74	....	....
" " (Low Grade Div.)*	110	....	47,026	.....	39.20	.....	21.51	20.30	0.735	1 97	3.96	0.64	....	6 24	12.81	....	....
Atlantic & Great West'n (1st & 2d Divs.)*	228	83	305 539	3.681	41 95	.....	17 35	.....	.....	3.11	4 77	0.50	0.50	5.95	14.83	1 80	2 84
" " (Third & Fourth Divs. *	197	48	155,977	3 250	33.79	.....	21.32	.....	.....	3 79	5 23	0.37	0.49	5 73	15 60	1.67	2.84
" " (Mahoning Division)*	88	53	138.602	2,615	39.15	.....	20 25	.....	.....	2.25	5 35	0.43	0 42	5 80	14.95	1.99	2.84
Atlantic & Gulf	343	20	43,961	2,198	.....	57.29	16 48	.....	.....	8 40	3.53	0 42	.....	8.30	20 69	....	2.02
California Pacific†	152	11	25,110	2,283	33 88	.....	22.81	5.5	.....	4.00	17 57	0.55	0.42	7.59	30 13	5 84	5.25
Central Pacific (Western Division)‡	201	57	146.239	2,566	37.81	.....	18.74	.....	.....	4.48	16 85	0.55	0.64	7 84	30 37	6 25	5 50
" " (Visalia Division)‡	157	10	22 866	2 287	51.23	...	17 06	.....	.....	11 97	12 29	0 57	0.61	7.48	32.92	6 25	5.50
" " (Tulare Division)‡	171	30	24,517	2,452	37.89	.....	13 32	.....	.....	4.98	16.76	0.76	0.14	7.40	30.04	6.25	5.50
" " (Los Angeles, Yuma, San Diego and Wilm. Divs.)‡	408	18	51,454	2,859	61.06	.....	18.47	.....	.....	4 69	10.49	0.55	0.06	7.25	23.05	6.25	5.50
" " (Sacramento Division)‡	120	34	79,520	2 340	.....	24.51	16.65	.....	.....	14 27	22.44	0 63	0.39	9 53	47.26	.....	5.50
" " (Oregon Division)‡	152	7	22.133	3,162	.....	38.03	19.40	.....	.....	6.32	14.46	0.56	0 22	7.68	29.24	.....	5.50
" " (Truckee Division)‡	205	27	63,250	2,343	37.76	25.29	17.34	.....	.....	7.39	19.06	0.59	0 50	8 67	36.21	6 25	5.50
" " (Humboldt Division)‡	201	19	51,786	2,726	49.41	.....	22.14	.....	.....	6.39	12.90	0.48	0.72	7.01	27 50	6.25	5.50
" " (Salt Lake Division)‡	219	25	71,519	2 860	35.43	.....	16.78	.....	.....	5.71	17.89	0.67	0.49	7 83	32 09	6 25	5.50
Cleve., Col., Cin. & Ind. (Col'bus Div.)	138	59	171 776	2 911	46.18	50.00	29.91	.....	.....	2.78	4 21	0.53	0 65	5.95	14.12	1.75	3.50
" " " (Indianapolis Div.)	208	64	227 189	3,550	42 35	44.60	21 95	.....	.....	3.21	4.81	0.59	1.03	5 76	15 40	1.75	3.50
" " " (Cincinnati Div.)	130	32	82,769	2,586	43.52	.....	2 .67	.....	.....	3.98	4.32	0.58	6.92	5.80	15.60	1 75	3.50
Cleveland & Pittsburgh*	199	77	163,921	2.129	55.59	.....	20.01	16.70	0.899	3.99	2 50	0 48	1.89	6 39	15.25	1 21	3.52
Cleveland & Mahoning Valley	41	6	17,825	2 971	53.20	.....	23 40	..	.....	0 64	3 66	0.25	0.96	5 70	11.21	1.81	2.76
Del., Lacka. & West. (Bloomsburg Div.)‖	80	19	46 020	2.422	.....	.....	33.96	.....	.....	0.47	0.57	.....	.....	5.15	6.19	.....	.....
Erie & Pittsburgh*	98	28	60,735	2,169	47.99	.....	20.94	17.60	0 767	2.00	3.76	0.53	1.41	6.47	14 17	1 80	1 80
Hannibal & St. Joseph	296	....	158,450	.....	38 09	...	19 57	.....	.....	3.43	5 86	0 3.	....	6.68	16.33	2 00	3.00
Illinois Central (Chicago Div.)‖	253	63	178,813	2,838	39.93	.....	16.46	20.74	.....	4.49	5.08	0 27	.....	5 39	15.78	1.90	4.50
" " (South Div.)‖	231	34	88,368	2,454	37.99	.....	14.82	16.38	..	4.66	5.30	0.31	.....	5.75	16 04	1 90	4.50
" " (North Div.)‖	225	36	78,409	2,178	36.26	.....	13 94	13.51	..	5.76	5.55	0.34	.....	6.03	17 68	1 90	4.50
" " (Iowa Div.)‖	401	43	96 383	2,241	35.35	.....	18.73	12.19	.....	4.36	8 04	0.27	.....	6.08	18 75	2.75	4 70
" " (Springfield Div.)‖	111	9	27,403	3,045	44.92	.....	16.79	13.24	.....	2.53	4.45	0.31	.....	5.08	12.39	1.90	4.50
Jeffersonville, Madison & Indianapolis*	226	40	92,667	2,316	46.45	29.9	14.89	21.1	0.920	3.49	5.65	0.45	2.78	5.67	18.04	2.50	2.20
Kansas Pacific and controlled lines¶	781	64	149,240	2.332	30.71	.....	13.69	.....	.....	4.87	10.98	0.40	.....	6.90	23.18	3 32	5.31
Kansas City, St. Jo. & Council Bluffs**	275	29	101,471	3.499	46.50	.....	28.00	18.6	.....	4.10	6.36	0.30	.....	6 50	17.20	2 80	3.50
Lake Shore & Mich. So. (Buff. Div.)††	.....	90	191,389	2,126	40.37	45.3	.....	.....	.....	4.06	7 89	0 49	.....	5.63	18. 0	3 05	5.69
" " (Erie Div.)††	.....	113	233,934	1,981	42.26	.....	.....	.....	.....	3.08	6.77	0.35	.....	5.29	15.53	2.72	5.43
" " (Toledo Div.)††	.....	85	150,524	1,770	54.68	57.00	.....	.....	.....	4.37	8 88	0.42	.....	5.58	19.28	3.12	4.08
" " (Mich. So. Div.)††	.....	207	364,042	1 758	41.55	65.94	.....	.....	.....	4.70	8.24	0.28	..	5.77	18.83	3.55	4.63
Louisville & Nashville (First Div.)††	332	....	110,916	.....	29.45	35.50	12.36	.....	.....	3.05	8.26	0.43	1.46	6.91	20.11	0.093	2.52
" " (Second Div.)††	200	....	73,493	.....	28.50	.....	11 78	.....	.....	4 39	8.02	0.50	1 85	6.10	20.86	0.089	2.76
" " (Memphis Div.)††	181	....	38,773	.....	35.00	.....	13.89	.....	.....	5.28	9.72	0.67	2.15	5.78	23.60	0.134	3.50
" " (Nashville & Decatur Div.)††	122	...	40,974	.....	42.25	.....	14.09	.....	.....	3.56	6.53	0.54	1.52	6.45	18.65	0.107	3.70
" " (South & North Ala. R R.)††	183	....	58 494	.....	30.50	76.00	12.42	.....	.....	3.92	7.67	0.71	1.64	6.50	20.44	0.09	2.25
Marquette, Houghton & Ontonagon	88	26	46 450	1,787	51.56	.....	27.65	.....	.....	1.34	10.02	0 53	.....	5.49	17.38	.....	.....
Missouri, Kansas & Texas‡	786	70	245.340	3,505	32 31	.....	10.23	16.20	1.190	4.52	6.45	0.50	.....	6 38	17.85	2.08	....
North'n Cent'l (Elm. & Canand'gua Div.)	147	44	118 648	2 583	31.95	.....	20.0	.....	.....	4.20	4.90	0.64	.....	5 72	15 46	0.06	2.24
Pennsylvania (New York Division) §§	120	129	289,597	2,245	36.91	.....	11.41	.....	.....	6.8.	7.90	1.00	.....	....	15.70	2.80	5.36
" (Amboy Division)§§	154	44	79 715	1,812	59.52	...	21.93	.....	.....	4.20	4 80	0.50	.....	....	9.50	2.80	5.39
" (Belvidere Division)§§	168	34	52,153	1,534	47.18	.....	13.85	.....	.....	6.90	6.0	0.80	.....	....	13.80	2.80	5.38
" (Philadelphia Division)§§	191	170	402,907	2,370	29.06	.....	14 9	.....	.....	5.00	3.90	0.70	.....	....	9.60	1.20	2 64
" (Middle Division)§§	132	88	280,496	3,187	31.73	.....	19.53	.....	.....	4.80	3.90	0.60	.....	....	9 30	1 20	2 64
" (Pittsb'gh Div., E. End)§§	.....	64	168 217	2,628	32.36	.....	11.90	.....	.....	4 70	5 50	0.7.	.....	....	10 90	1.20	2.64
" (Pittsb'hDiv., West End)§§	.....	93	233,554	2 511	32.46	.....	13 70	.....	.....	6.50	3.70	0 7.	.....	....	10 90	1.20	2.64
" (Tyrone Division)§§	107	28	65,029	2,322	30.8	.....	18.80	.....	.....	6.50	6.00	0 60	.....	....	13.10	1.20	2 64
" (West Pennsylvania Div)§§	104	26	62,369	2,399	35.62	.....	30.49	.....	.....	2.60	3 60	0 4.	.....	....	6.60	1 20	2.64
" (Lewistown Division)§§	56	6	11,197	1,851	34.67	.....	20 49	.....	.....	2.00	3.50	0.50	.....	....	6.0.	1.20	2.67
" (Bedford Division)§§	57	3	8,168	2,723	38 90	.....	25 64	.....	.....	1.70	3 40	0.40	.....	....	5 5.	1 20	2.68
Pitts., Ft. Wayne & Chi. (East'n Div.)*	371	153	369,244	2,413	47.99	.....	20.94	14.50	0.895	3.34	3 39	0 52	1.83	6.26	15.34	1.78	1.78
" " " (Western Div.)*	290	109	236,808	2,299	45.00	.....	21 45	22.0	0.748	3.35	4.23	0.36	2.03	6 20	16. 8	.....	.....
Pitts., Cin. & St. L. (Little Miami Div.)*	197	38	100.880	2,655	46.34	....	13.21	17.04	0.629	3.81	4 15	0.59	1 66	5.67	15 8.	1 84	2.00
" " " (Pitts. Cin. & St. L. Div.)*	224	78	233,708	2,996	32.37	.....	15.73	19 08	0.869	6.14	3 06	0 60	2.26	5 91	17 97	0 90	3 00
Pittsburgh, Titusville & Buffalo*	158	....	63.415	.....	44.33	.....	18.03	16.90	1.251	3.87	4.20	0.62	.....	5.90	14.59	.....	.....
St. Louis, I. M. & So. (Arkansas Div.)	325	32	90,585	2.831	.....	45.30	16 70	.....	.....	2.38	5.41	0.56	.....	6 58	14.97	.....	2.48
St. Louis & San Francisco¶	328	....	70.916	.....	34.10	.....	14.50	.....	.....	4.00	6.16	0.37	.....	5.73	16.26	2 10	2.15
St. Louis & Southeastern (St. Louis Div.)	210	...	58 075	....	53.50	.....	15.30	.....	.....	5.30	2.40	0 30	.....	5.60	13.80	0 98	....
" " (Nashville Div.)	146	....	51,289	.....	32.20	.....	14.40	.....	.....	5.30	2.50	0 30	.....	6.50	14.50	0.73	....
Stockton & Copperopolis	49	3	4,445	1,482	36 57	58.62	18.29	.....	.....	0.82	11 91	0.61	0 62	7.98	21.94	6.25	5 50
West Jersey §§	128	17	48,154	2 833	45.17	.....	20. 0	.....	.....	2.8.	8.10	0 50	.....	....	11.40	3.60	5.69

* Five empty cars rated as three loaded ones.
† Car average includes mixed trains.
‡ Switching engines allowed 6 miles per hour; helping engines actual distance and 4 miles per hour while waiting trains.
§ Fuel not estimated.
‖ Two empty cars rated as one loaded one.
¶ Switching and work-train engines allowed 6 miles per hour.
†† Switching engines allowed 6 miles per hour.
** Three empty cars rated as two loaded ones.
‡‡ Water service (not included above). 0 80 ct. per mile; rental of engines, 0.39 ct. per mile; three empty cars rated as two loaded ones; switching and work-train engines allowed 6 miles per hour.
§§ Engineers', firemen's and wipers' wages not included in cost.
The ton of coal is 2,000 lbs., unless otherwise noted; 25 bushels counted to the ton.